

# **Objective items for integrated science**

**Book one**

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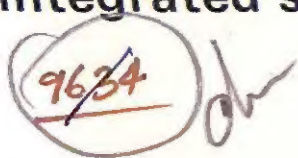
**LAU HUT YEE**

**A comprehensive  
selection of  
objective-type  
questions**



**Longman**

# Objective items for integrated science



LAU HUT YEE



## Book 1

With answers



Longman Malaysia

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## Preface

This is the first book in a series of three. The aims of the books are:

- 1 To help pupils in their self-study and self-revision of work done
- 2 To reveal to pupils the sections they may be weak in; and in so doing, enable them to improve in these sections
- 3 To familiarise pupils with the types of questions they will be asked in the final examination; and to give them extensive practice in answering such questions
- 4 To stimulate discussion among pupils in a class
- 5 To help teachers evaluate the progress of their pupils regularly and accurately

This first book of objective items closely follows the syllabus and the worksheets for Integrated Science issued by the Ministry of Education for Form One. The items have been set so as to encourage pupils to make careful and accurate observations during their experiments, and to develop an inquiring mind. In thinking out the answers to the questions, pupils also revise in an active way the scientific laws, principles and methods they have learnt. Information gathered in this way remains long in the mind of pupils.



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# 1 Introducing science

---

## Basic units

1 In a school laboratory length is usually measured in

- A. inches
- B. centimetres
- C. kilometres
- D. feet
- E. yards

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

2 One metre is as long as

- A. 1 cm
- B. 10 cm
- C. 100 cm
- D. 1,000 cm
- E. 10,000 cm

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

3 1,000 cm is the same as

- A. 1 m
- B. 10 m
- C. 100 m
- D. 1,000 m
- E. 10,000 m

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

4 How long is one kilometre?

- A. 10 m
- B. 100 m
- C. 1,000 m
- D. 10,000 m
- E. 100,000 m

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

5 1,000 mm is equal to

- A. 10 cm
- B. 100 cm**
- C. 1,000 cm
- D. 10,000 cm
- E. 100,000 cm

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

6 10 cm is the same as

- A. 1 mm
- B. 10 mm
- C. 100 mm
- D. 1,000 mm
- E. 10,000 mm**

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

7 1.2 km is the same as

- A. 12 m
- B. 120 m
- C. 1,200 m
- D. 12,000 m
- E. 120,000 m**

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

8 A short way of writing one cubic centimetre is

- A. cm
- B.  $\text{cm}^2$
- C.  $\text{cm}^3$**
- D. 3 cm
- E. none of these

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

9 How much is one litre of water?

- A.  $1 \text{ cm}^3$
- B.  $10 \text{ cm}^3$
- C.  $100 \text{ cm}^3$
- D.  $1,000 \text{ cm}^3$
- E.  $10,000 \text{ cm}^3$**

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~



**10** In a school laboratory we can take one millilitre to be the same as

- A. 1 cm<sup>3</sup>
- B. 1 g
- C. 1 °C
- D. 1 mm
- E. 1 litre

☐ A ☐ B ☐ C ☐ D ☐ E

**11** 4 litres is equal to

- A. 4 ml
- B. 40 ml
- C. 400 ml
- D. 4,000 ml
- E. 40,000 ml

☐ A ☐ B ☐ C ☐ D ☐ E

**12** In a school laboratory weight is usually measured in

- A. g
- B. mm
- C. cm
- D. ml
- E. °C

☐ A ☐ B ☐ C ☐ D ☐ E

**13** One thousand grams is called one

- A. milligram
- B. centigram
- C. kilogram
- D. pound
- E. ounce

☐ A ☐ B ☐ C ☐ D ☐ E

**14** One gram is equal to

- A. 1 mg
- B. 10 mg
- C. 100 mg
- D. 1,000 mg
- E. 10,000 mg

☐ A ☐ B ☐ C ☐ D ☐ E

15 How many grams are there in 2 kg?

- A. 2 g
- B. 20 g
- C. 200 g
- D. 2,000 g
- E. 20,000 g

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

16 In a school laboratory temperature is usually *measured* in

- A. g
- B. gm
- C. °C
- D. °F
- E. ml

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

17 The temperature of steam is

- A. 1°C
- B. 10°C
- C. 100°C
- D. 1,000°C
- E. 10,000°C

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

18 The temperature of melting ice is

- A. 0°C
- B. 1°C
- C. 10°C
- D. 100°C
- E. 1,000°C

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

## Laboratory techniques

19 What does a thermometer measure?

- A. amount of heat
- B. air pressure
- C. force of gravity

- D. weight
- E. temperature

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

20 The silvery liquid in a thermometer is

- A. alcohol
- B. an acid
- C. liquid silver
- D. coloured water
- E. mercury

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

21 Which one of the following would you use to measure out 51.0 ml of water?

- A. measuring cylinder
- B. graduated beaker
- C. conical flask
- D. round-bottomed flask
- E. lever balance

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

22 Some chalk is mixed with water. The chalk can be recovered by

- A. diffusion
- B. precipitation
- C. filtering the mixture
- D. heating the mixture
- E. pouring the mixture through a filter-funnel

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

23 The solid left on the filter-paper in the filter-funnel after filtering is called the

- A. filtrate
- B. residue
- C. precipitate
- D. substance
- E. mixture

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

24 During filtering the liquid which passes through the filter-paper is called the

- A. filtrate
- B. residue
- C. precipitate
- D. substance
- E. mixture

~~:-A:-~~ ~~:-B:-~~ ~~:-C:-~~ ~~:-D:-~~ ~~:-E:-~~

25 A piece of calcium is added to water. What is seen?

- A. The calcium sinks in the water
- B. The calcium floats on the water
- C. The calcium catches fire on touching the water
- D. The calcium sinks, reacts with the water and sets free a gas
- E. The calcium dissolves in the water, but no gas is set free

~~:-A:-~~ ~~:-B:-~~ ~~:-C:-~~ ~~:-D:-~~ ~~:-E:-~~

26 Never pick up a piece of calcium with bare fingers because

- A. calcium is a very poisonous substance
- B. calcium is a very delicate substance
- C. calcium sets free a poisonous gas
- D. calcium reacts with the moisture on the fingers
- E. calcium catches fire on touching moisture

~~:-A:-~~ ~~:-B:-~~ ~~:-C:-~~ ~~:-D:-~~ ~~:-E:-~~

27 A boy is playing a game of badminton. Which of the following happens to him?

- |    | <i>Pulse</i> | <i>Respiration</i> |
|----|--------------|--------------------|
| A. | Faster       | Slower             |
| B. | Slower       | Slower             |
| C. | Slower       | Faster             |
| D. | Faster       | Faster             |
| E. | Faster       | Same               |

~~:-A:-~~ ~~:-B:-~~ ~~:-C:-~~ ~~:-D:-~~ ~~:-E:-~~

**28** The average heart-beat rate of an adult is about

- A. 90 beats per minute
- B. 80 beats per minute
- C. 70 beats per minute
- D. 60 beats per minute
- E. 50 beats per minute

☐ A ☐ B ☐ C ☐ D ☐ E

**29** The average respiration or breathing rate for a person is usually

- A. 10 - 15 times per minute
- B. 15 - 20 times per minute
- C. 20 - 25 times per minute
- D. 25 - 30 times per minute
- E. 30 - 35 times per minute

☐ A ☐ B ☐ C ☐ D ☐ E

**30** The graph shows the reaction times of the pupils in a class. How many pupils have a reaction time of less than 0.2 second?

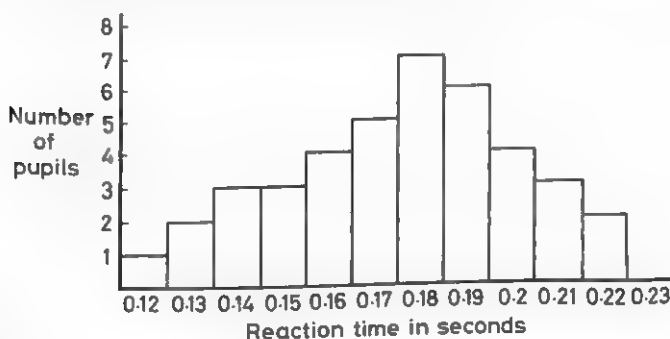


fig 1

- A. 4
- B. 5
- C. 9
- D. 31
- E. 40

☐ A ☐ B ☐ C ☐ D ☐ E

**31** What type of flame from a burner gives out more heat? A flame that is

- A. sooty

- B. tall
- C. yellow
- D. quiet yellow
- E. blue

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

## Experiments with observations and some conclusions

32 Which of these things are attracted by a magnet?

- I. a brass key
- II. an iron nail
- III. a steel knife
- IV. a plastic pen

- A. I, II and III
- B. I and III
- C. II and IV
- D. IV only
- E. II and III

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

33 The things are arranged as shown in the diagram. In one breath a boy sucks air out from the bottle. The water rises in the bottle.

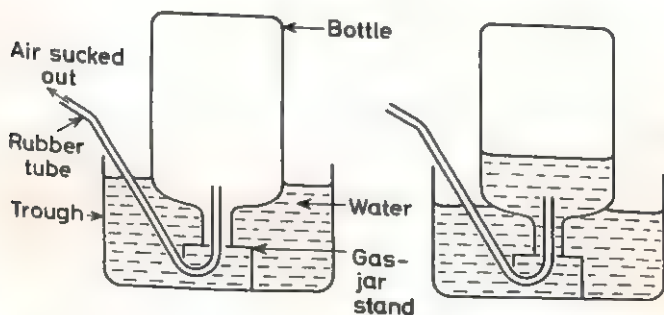


fig 2

The volume of water in the bottle is equal to

- A. the volume of air the boy's lungs can hold



- B. the volume of air the boy's mouth can hold
- C. the volume of air the boy's stomach can hold
- D. the volume of air which passes through the boy's nose
- E. none of the above conclusions is correct

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- 34** The diagram shows a rubber sucker stuck onto a wall.

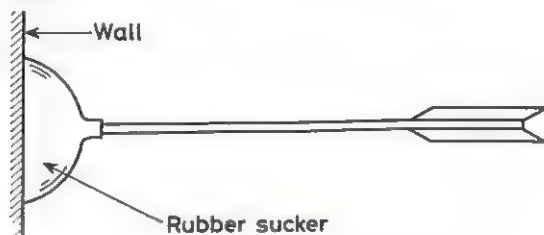


fig 3

The rubber sucker stays on because

- A. of its weight
- B. of the force of gravity
- C. of atmospheric pressure
- D. it is made of rubber
- E. the wall is rough

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- 35** One end of a plastic comb is vigorously rubbed with a piece of yellow cloth. What is seen when the rubbed end of the comb is brought near some tiny pieces of dry paper?

- A. The rubbed end of the comb scatters the pieces of paper
- B. The rubbed end of the comb attracts the pieces of paper
- C. The rubbed end of the comb attracts some pieces and scatters some pieces
- D. The rubbed end of the comb has no effect on the pieces of paper
- E. The rubbed end of the comb is hot and chars the pieces of paper

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- 36** Choose the best answer to the above question. The rubbed end of the comb behaves in that manner because
- A. it is very warm
  - B. it has magnetic power
  - C. it gains mechanical energy
  - D. it is charged with heat energy
  - E. it is charged with 'electricity at rest'

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- 37** The bottle shown in the diagram contains water. A boy blows very hard into the bottle through the glass tube and then stops. What happens?

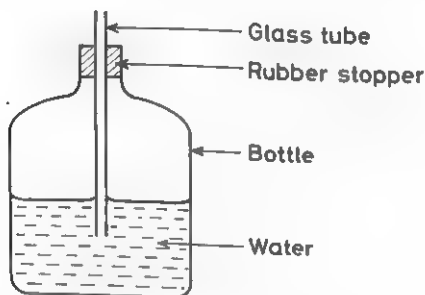


fig 4

- A. The air just bubbles through the water
- B. The water shoots out of the bottle
- C. The water rises halfway up the tube
- D. The stopper is pushed out
- E. The glass tube breaks

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- 38** Which statement below explains question 37?

- A. The air passes through the water
- B. The increase in air pressure forces out the water
- C. The slight increase in air pressure makes the water rise only halfway up the tube
- D. The big increase in air pressure pushes out the stopper
- E. The water pressure breaks the glass tube

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- 39 The glass tube connected to the flask contains a column of water. A pupil places his hands on the flask. The water column slowly moves away from point P, and towards point Q. Why does this happen?

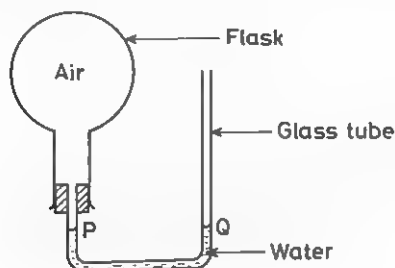


fig 5

- A. The air in the flask expands  
 B. The air in the flask contracts  
 C. The water in the tube expands  
 D. The water in the tube contracts  
 E. The glass flask contracts

☐ A ☐ B ☐ C ☐ D ☐ E

- 40 The graph shows the heights of the pupils in a class.

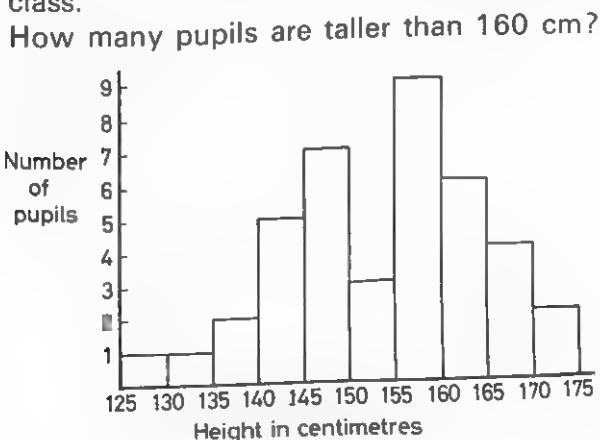


fig 6

- A. 6  
 B. 9  
 C. 12  
 D. 28  
 E. 40

☐ A ☐ B ☐ C ☐ D ☐ E

## 2 Looking at living things

### The earthworm

- 1 Which numbered part of the earthworm is known as the saddle?

- A. 1
- B. 2
- C. 3
- D. 4
- E. 5

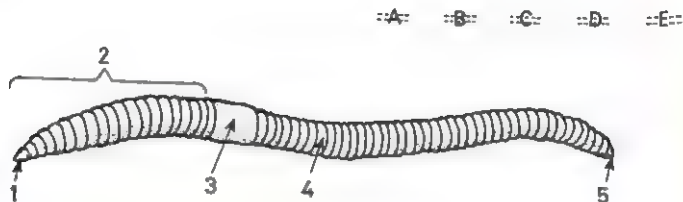


fig 7

- 2 Where are the large segments of the earthworm?

- A. at 1
- B. at 2
- C. at 3
- D. at 4
- E. at 5

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- 3 The mouth of the earthworm is situated at the part numbered

- A. 1
- B. 2
- C. 3
- D. 4
- E. 5

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

4 The tiny opening at the rear of an earthworm is called the

- A. mouth
- B. saddle
- C. bristle
- D. anus
- E. segment

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

5 The earthworm passes out waste products through its

- A. mouth
- B. saddle
- C. bristle
- D. anus
- E. segment

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

6 The 'rings' on an earthworm are called the

- A. saddles
- B. bristles
- C. anus
- D. segments
- E. pores

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

7 The tiny hair-like structures on the lower surface of an earthworm are called

- A. saddles
- B. bristles
- C. segments
- D. pores
- E. none of these

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

8 Why is the lower surface of an earthworm rougher than the top surface?

- A. The lower surface is dry
- B. The lower surface has bristles
- C. The lower surface scratches against the ground

- D. The lower surface does not get sunlight
- E. The earthworm crawls on its lower surface

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

9 Choose the correct statement.

- A. An earthworm has a very soft backbone
- B. An earthworm does not have a backbone
- C. An earthworm has tiny air-holes on its body
- D. An earthworm has tiny eyes
- E. An earthworm has two short feelers

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

10 Choose the statements which are true.

- I. An earthworm crawls away from light
- II. An earthworm crawls towards light
- III. An earthworm moves faster on a sheet of blotting paper than on a sheet of glass
- IV. An earthworm has no sense of smell

- A. I and III
- B. II and III
- C. I and IV
- D. II and IV
- E. III and IV

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

11 Which statement is true?

- A. Earthworms like to live in damp and dark places
- B. Earthworms have tiny scales on the body
- C. Earthworms do not need air
- D. Earthworms do not need water
- E. Earthworms belong to the same group of animals as snakes

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

12 Earthworms must keep their skin moist in order to

- A. move through the soil
- B. keep away insects
- C. keep cool
- D. absorb oxygen
- E. avoid getting stuck to the soil

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~



**13** Choose the correct statements.

- I. Earthworms make burrows
- II. Earthworms catch insects for food
- III. Earthworms can digest the soil
- IV. Earthworms mix the soil

- A. I, II and III
- B. I and III
- C. II and IV
- D. IV only
- E. I and IV

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**14** Earthworms are considered the friends of farmers. Which reasons given below support this statement?

- I. They make the soil fertile with their waste substances
- II. They like moist soil
- III. They make holes in the soil and therefore give plant roots more oxygen
- IV. They take vegetable matter from the soil

- A. I, II and III
- B. I and III
- C. II and IV
- D. IV only
- E. III and IV

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**15** Which statements show that earthworms are living things?

- I. They are sensitive to light
- II. They choose their food
- III. They can move from place to place
- IV. They look like baby snakes

- A. I, II and III
- B. I and III
- C. II and IV
- D. IV only
- E. none of these combinations

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**16** How does an earthworm get oxygen?

- A. It uses its gills
- B. It uses its lungs
- C. It uses the air-holes on its body
- D. It takes in oxygen through its moist skin
- E. It breathes through its mouth

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

## **The garden snail**

**17** When do garden snails usually go out to look for food?

- A. in the morning
- B. in bright sunlight
- C. on a dry bright day
- D. at night
- E. at all times

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**18** Where are garden snails most likely to be found?

- A. in damp, dark places
- B. in damp, bright places
- C. in dry, dark places
- D. in dry, bright places
- E. in dry, hot places

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**19** To study the food habits of garden snails place the types of food given below in a tank containing the snails. Which food is the most popular with the snails?

- A. chocolate
- B. lump of sugar
- C. white of egg
- D. meat
- E. leafy shoots

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**20** Which part of a garden snail is the most sensitive?

- A. the shell
- B. the body

- C. the tentacles
- D. the head
- E. the foot

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**21** Which description applies to a garden snail's body?

- A. It is dry and unsegmented
- B. It is dry and segmented
- C. It is wet and unsegmented
- D. It is wet and segmented
- E. It is hard and segmented

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**22** When a garden snail crawls forwards, it leaves behind a slimy trail. In what way does the slime help?

- A. It helps the snail to move
- B. It helps the snail to get food
- C. It helps the snail to get oxygen
- D. It helps the snail to keep enemies away
- E. It helps the snail to keep cool

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**23** Where are the eyes of a garden snail located?

- A. at the tip of the short tentacles
- B. at the tip of the long tentacles
- C. at the tip of the shell
- D. in front of the mouth
- E. below the mouth

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**24** Garden snails are pests because

- A. they spread diseases
- B. they damage plants
- C. they have a hard shell
- D. they have a slimy body
- E. they come out at night

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

## The grasshopper

- 25 Where are grasshoppers most likely to be found?
- A. in open, sunny farmlands
  - B. in open, swampy shore
  - C. in dry, sandy lands
  - D. in shaded, dark jungles
  - E. in wet, sandy lands
- ~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~
- 26 Which description is false?
- A. A grasshopper has four wings
  - B. A grasshopper has four jointed legs
  - C. A grasshopper has two feelers
  - D. A grasshopper has two large eyes
  - E. A grasshopper has a segmented body
- ~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~
- 27 The third pair of legs of a grasshopper is long and strong. What is the main use of this pair of legs?
- A. for defending itself against enemies
  - B. for catching food
  - C. for flying
  - D. for crawling quickly
  - E. for hopping
- ~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~
- 28 Which regions are present in a grasshopper?
- A. head, thorax and abdomen
  - B. head and thorax
  - C. head and abdomen
  - D. thorax and abdomen
  - E. head, abdomen and tail
- ~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~
- 29 How does a grasshopper get oxygen?
- A. It uses its gills
  - B. It uses its lungs

- C. It uses its air-holes
- D. It uses its segments
- E. It uses its abdomen

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**30** Which statement is true?

- A. Baby grasshoppers look like worms
- B. Baby grasshoppers look like their parents
- C. Baby grasshoppers are contained in a cocoon
- D. Baby grasshoppers feed on meat
- E. Baby grasshoppers do not have eyes

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**31** Grasshoppers are pests because

- A. they can fly
- B. they are noisy insects
- C. they carry germs
- D. they feed on plants
- E. they are green and can hide on plants

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

## Fish

**32** A fish takes in oxygen with its

- A. wet skin
- B. gill-covers
- C. air-holes
- D. lungs
- E. gills

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**33** A fish balances itself in water by

- A. using its fins
- B. using its scales
- C. using its head
- D. sucking in water through its mouth
- E. opening and closing its gill-covers

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

34 Choose the false statement.

- A. The scales protect a fish
- B. The tail fin helps to drive the fish forwards
- C. The eyes of a fish have eye lids
- D. A fish has nostrils
- E. A fish has two paired fins

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

35 On each side of a fish there is a lateral line. What is the use of this line?

- A. to enable the fish to hide itself from enemies
- B. to help the fish to rise to the surface of the water
- C. to keep the fish upright in water
- D. to frighten away enemies
- E. to help the fish sense vibrations in the water

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

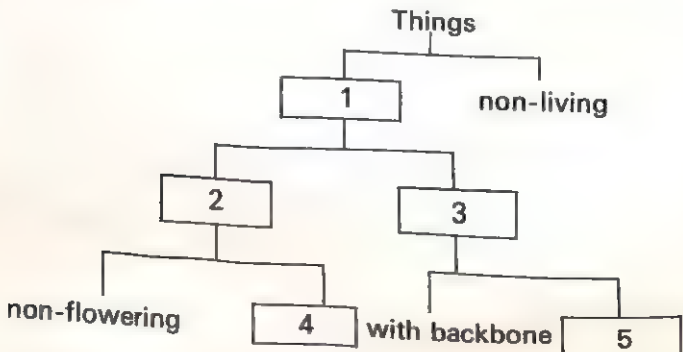
36 Which item is incorrectly matched?

- A. man: legs
- B. earthworm: bristles
- C. grasshopper: legs
- D. snail: muscular foot
- E. fish: gills

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

## Classification of plants

The table below shows how things may be classified into groups. In questions 37 - 39, choose the correct word for the empty box.





37 The correct word for box 1 is

- A. living
- B. plants
- C. animals
- D. flowering
- E. without backbone

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

38 The correct word for box 2 is

- A. living
- B. plants
- C. animals
- D. flowering
- E. without backbone

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

39 The correct word for box 3 is

- A. living
- B. plants
- C. animals
- D. flowering
- E. without backbone

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

40 Divide the five plants into two groups.

*Plants*

mushroom

fern

orchid

rose

hibiscus

**A**

mushroom      orchid

fern              rose  
                    hibiscus

**B**

mushroom      fern

orchid              rose

hibiscus              hibiscus



20, 7, 05  
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**C**

mushroom	fern
rose	orchid
	hibiscus

**D**

hibiscus	mushroom
rose	fern
	orchid

**E**

hibiscus	mushroom
fern	rose
	orchid

Which group will be a proper division?

☐ A ☐ B ☐ C ☐ D ☐ E

**41** Divide the plants into two groups.

*Plants:*

moss, seaweed, toadstool,

papaya, sunflower

Which group will be a proper division?

- A. moss, seaweed, toadstool/papaya, sunflower
- B. moss, seaweed, papaya/toadstool, sunflower
- C. moss, toadstool, papaya/seaweed, sunflower
- D. moss, papaya, sunflower/seaweed, toadstool
- E. papaya, sunflower, seaweed/moss, toadstool

☐ A ☐ B ☐ C ☐ D ☐ E

42 Which plant should not be in the group?

- A. moss
- B. fern
- C. mushroom
- D. spider lily
- E. seaweed

☐ A ☐ B ☐ C ☐ D ☐ E

43 Choose the plant which does not belong to the group.

- A. papaya
- B. water melon
- C. seaweed
- D. coconut
- E. mango

☐ A ☐ B ☐ C ☐ D ☐ E

44 Which item does not belong to the group?

- A. seaweed
- B. moss
- C. toadstool
- D. fern
- E. balsam

☐ A ☐ B ☐ C ☐ D ☐ E

45 One example of a non-flowering green plant is

- A. fern
- B. bougainvillea
- C. rose
- D. allamanda
- E. toadstool

☐ A ☐ B ☐ C ☐ D ☐ E

46 One example of a non-flowering plant which is not green is

- A. orchid
- B. frangipanni
- C. mushroom
- D. canna
- E. sunflower

☐ A ☐ B ☐ C ☐ D ☐ E

**47** Which item should not be in the list?

- A. worm
- B. lizard
- C. duck
- D. banana
- E. boy

~~..A:~~ ~~..B:~~ ~~..C:~~ ~~..D:~~ ~~..E:~~

### **Animals: their classification and characteristics**

**48** Which item does not belong to the group?

- A. earthworm
- B. spiders
- C. ants
- D. fish
- E. prawns

~~..A:~~ ~~..B:~~ ~~..C:~~ ~~..D:~~ ~~..E:~~

**49** What is a vertebrate?

- A. It is an animal which has a backbone
- B. It is an animal which has no backbone
- C. It is an animal which has hair
- D. It is an animal which has scales
- E. It is an animal which walks upright

~~..A:~~ ~~..B:~~ ~~..C:~~ ~~..D:~~ ~~..E:~~

**50** A man is a vertebrate because he has

- A. two legs
- B. a backbone
- C. a big brain
- D. hair
- E. ear-lobes

~~..A:~~ ~~..B:~~ ~~..C:~~ ~~..D:~~ ~~..E:~~

**51** Which of these animals are vertebrates?

- I. crab
- II. frog
- III. spider
- IV. turtle

- A. I, II and III
- B. I and III
- C. II and IV
- D. IV only
- E. I and IV

~~==A==~~ ~~==B==~~ ~~==C==~~ ~~==D==~~ ~~==E==~~

**52** What is an invertebrate?

- A. It is an animal which has six legs
- B. It is an animal which has more than two legs
- C. It is an animal which has no legs
- D. It is an animal which has a backbone
- E. It is an animal which has no backbone

~~==A==~~ ~~==B==~~ ~~==C==~~ ~~==D==~~ ~~==E==~~

**53** A cockroach is an invertebrate because it has

- A. six legs
- B. no backbone
- C. no hair
- D. wings
- E. two long feelers

~~==A==~~ ~~==B==~~ ~~==C==~~ ~~==D==~~ ~~==E==~~

**54** Which of these are invertebrates?

- I. scorpion
- II. prawn
- III. snail
- IV. lizard

- A. I, II and III
- B. I and III
- C. II and IV
- D. IV only
- E. II and III

~~==A==~~ ~~==B==~~ ~~==C==~~ ~~==D==~~ ~~==E==~~

In questions 55 - 60, choose the animal which does not belong to the group.

55

- A. horse
- B. pigeon
- C. man
- D. rat
- E. rabbit

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

56

- A. sparrow
- B. swallow
- C. tortoise
- D. hen
- E. duck

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

57

- A. lizard
- B. cobra
- C. turtle
- D. python
- E. mouse

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

58

- A. angel fish
- B. fighting fish
- C. sea horse
- D. ant eater
- E. Indian shark

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

59

- A. garden snail
- B. gold fish
- C. cow
- D. toad
- E. pigeon

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~



60

- A. snail
- B. ant
- C. porcupine
- D. centipede
- E. scorpion

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

61 Which of the features illustrated are present in a fish?

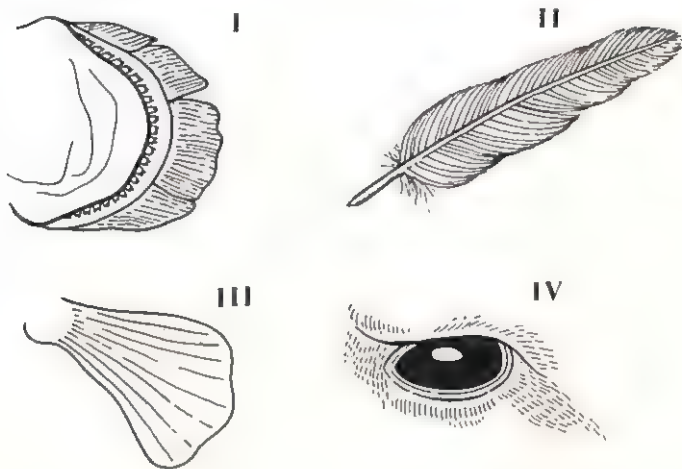


fig 8

- A. I, II and III
- B. I and III
- C. II and IV
- D. IV only
- E. I, III and IV

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

62 Of the following statements about fish, only one is true. Choose the true statement.

- A. A fish breathes with lungs
- B. A fish has two pairs of fins only
- C. A fish has no backbone
- D. A fish has scales on the body
- E. The young of fish are born

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**63** Which of the features illustrated below are present in birds?

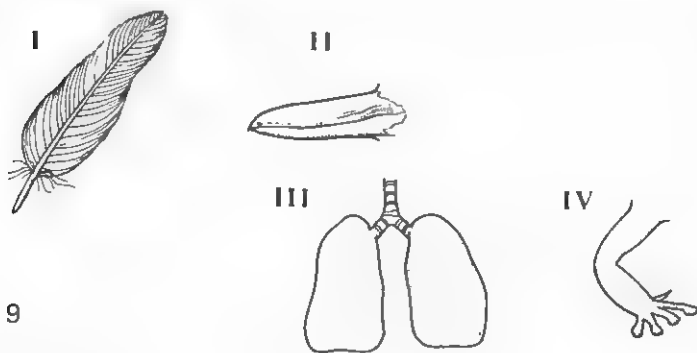


fig 9

- A. I, II and III
- B. I and III
- C. II and IV
- D. IV only
- E. I and II

☐ A ☐ B ☐ C ☐ D ☐ E

**64** Which of the features illustrated below are characteristics of mammals?

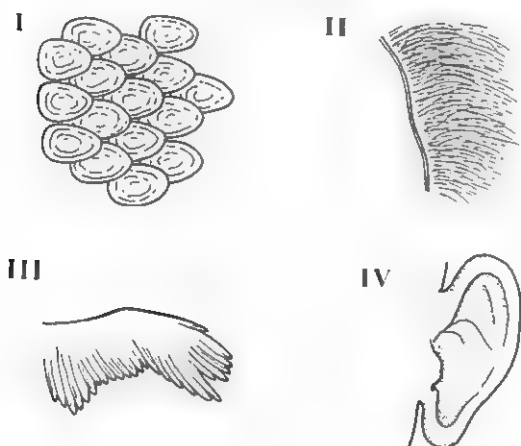


fig 10

- A. I, II and III
- B. I and III
- C. II and IV
- D. IV only
- E. II only

☐ A ☐ B ☐ C ☐ D ☐ E

**65** What is an amphibian?

- A. It is an animal which has a backbone
- B. It is an animal which has a skin covered with scales
- C. It is an animal which lives in water only
- D. It is an animal which lives on land only
- E. It is an animal which has a backbone and can live on land or in water

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**66** An example of an amphibian is

- A. a fish
- B. a snake
- C. a toad
- D. a duck
- E. a monkey

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**67** Which of these features are present in an amphibian such as a frog?

- I. moist skin
- II. wet scales
- III. four digit fore-limb
- IV. gills

- A. I, II and III
- B. I and III
- C. II and IV
- D. IV only
- E. I and II

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**68** How does a toad protect its eggs from enemies?

- A. by covering the eggs with a slimy substance
- B. by covering the eggs with a shell
- C. by laying the eggs in water
- D. by laying eggs with large yolks
- E. by laying the eggs in a string

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**69** The body of a reptile is covered with

- A. moist skin
- B. hairs
- C. fur
- D. scales
- E. feathers

~~==A==~~ ~~==B==~~ ~~==C==~~ ~~==D==~~ ~~==E==~~

**70** Which of these statements is not true for reptiles?

- A. They have scales on their skins
- B. They have no external ears
- C. They have lungs
- D. They lay eggs
- E. They never have legs

~~==A==~~ ~~==B==~~ ~~==C==~~ ~~==D==~~ ~~==E==~~

**71** How does a snake get oxygen?

- A. It uses its gills
- B. It uses its lungs
- C. It uses air-holes
- D. It absorbs oxygen through its skin
- E. It breathes through its mouth

~~==A==~~ ~~==B==~~ ~~==C==~~ ~~==D==~~ ~~==E==~~

**72** Which statements are true for birds?

- I. They lay eggs which are protected by a shell
- II. They have scales on their legs
- III. They have no teeth
- IV. They have five toes to each foot

- A. I, II and III
- B. I and III
- C. II and IV
- D. IV only
- E. I, II and IV

~~==A==~~ ~~==B==~~ ~~==C==~~ ~~==D==~~ ~~==E==~~

**73** Which of these are characteristics of birds?

- I. They have a beak
- II. They have two wings

- III. They have gills
- IV. They have feathers

- A. I, II and III
- B. I and III
- C. II and IV
- D. IV only
- E. I, II and IV

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**74** Birds are

- A. animals which can fly
- B. toothless animals
- C. animals which have a backbone
- D. animals which lay yolky eggs
- E. animals with backbones and with feathers

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**75** An example of a mammal which can fly is

- A. a flying lizard
- B. a housefly
- C. a dragonfly
- D. a bat
- E. none of these

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**76** The ..... is a good example of a mammal which lives in water.

- A. shark
- B. lobster
- C. whale
- D. sea snake
- E. jelly fish

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**77** Which group of animals give birth to young?

- A. fish
- B. amphibians
- C. reptiles
- D. birds
- E. mammals

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**78** Which animal feeds its young with milk?

- A. snake
- B. earthworm
- C. rabbit
- D. shark
- E. toad

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**79** Which of the following are characteristics of mammals?

- I. They suckle their young
- II. Their young are born alive
- III. Their body is covered with hairs
- IV. They breathe with lungs

- A. I, II, III and IV
- B. I, II and III
- C. I and III
- D. II and IV
- E. I and IV

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**80** Which item is wrongly matched?

- A. earthworms: bristles
- B. fish: fins
- C. toads: legs
- D. cobras: legs
- E. birds: legs and wings

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**81** Which item is incorrectly matched?

- A. fish: scales
- B. snake: shell
- C. frog: moist skin
- D. sparrow: feathers
- E. rat: hair

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**82** Choose the item which is incorrectly matched.

- A. goldfish: gills

- B. toad: gills
- C. cobra: lungs
- D. hen: lungs
- E. cat: lungs

☐A: ☐B: ☐C: ☐D: ☐E:

**83** Which group of animals have their eggs fertilised outside their body?

- A. amphibians
- B. reptiles
- C. birds
- D. mammals
- E. none of these

☐A: ☐B: ☐C: ☐D: ☐E:

**84** Which of the following statements is correct?

- A. A snake is a mammal which has no legs
- B. A fish is a reptile because it has scales
- C. All reptiles are animals, but not all animals are reptiles
- D. All animals are vertebrates because they need oxygen
- E. An earthworm has very tiny eyes

☐A: ☐B: ☐C: ☐D: ☐E:





8 This energy is present in a wound up spring

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

*Heading*

A. light energy

D. electrical energy

B. chemical energy

E. sound energy

C. heat energy

*Statements*

9 This energy is used up when kerosene is burnt

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

10 Plenty of this energy is released when an atom is split

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

11 Green plants use this energy

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

12 Green plants store energy in this form

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

*Heading*

A. sound energy

D. atomic energy

B. electrical energy

E. kinetic energy

C. mechanical energy

*Statements*

13 A power station produces this energy

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

14 You are using this energy when you lift a block of wood

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

15 When an alarm clock rings, this energy is produced

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

16 A boy who is free-wheeling down a slope possesses this energy

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

17 What sort of energy has a charging bull?

A. kinetic

B. potential

C. mechanical

D. chemical

E. heat

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

18 What sort of energy has a ball rolling on a table?

- A. potential
- B. mechanical
- C. kinetic
- D. sound
- E. light

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

19 What energy can be stored in a steel bar, and not in a copper bar?

- A. chemical
- B. electrical
- C. heat
- D. potential
- E. magnetic

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

20 What energy can be stored in the spring of a watch?

- A. sound
- B. chemical
- C. electrical
- D. heat
- E. potential

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

21 What sort of energy has a pendulum at the top of its swing?

- A. potential
- B. kinetic
- C. magnetic
- D. light
- E. atomic

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

22 Water which is half way down a waterfall has two types of energy. They are

- A. mechanical and kinetic
- B. potential and kinetic
- C. potential and mechanical

- D. sound and kinetic
- E. sound and electrical

☐A: ☐B: ☐C: ☐D: ☐E:

**23** As a cart is pushed up a hill what energy is gradually increasing?

- A. chemical
- B. potential
- C. kinetic
- D. mechanical
- E. heat

☐A: ☐B: ☐C: ☐D: ☐E:

**24** What sort of energy change takes place when an electric oven is turned on?

- A. heat → electrical
- B. electrical → heat
- C. sound → heat
- D. chemical → heat
- E. heat → mechanical

☐A: ☐B: ☐C: ☐D: ☐E:

**25** A cabbage plant can turn light energy into . . . . energy.

- A. heat
- B. mechanical
- C. chemical
- D. magnetic
- E. kinetic

☐A: ☐B: ☐C: ☐D: ☐E:

**26** When a guitar string is plucked, kinetic energy is changed into . . . . . energy.

- A. potential
- B. chemical
- C. mechanical
- D. sound
- E. heat

☐A: ☐B: ☐C: ☐D: ☐E:

**27** It is possible to obtain a great supply of energy by splitting

- A. any substance
- B. compounds
- C. elements
- D. atoms
- E. metals

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**28** Which statements are correct?

- I. Energy can be destroyed
- II. Energy can be made
- III. Energy cannot be changed from one form into another form
- IV. Energy can be changed from one form into another

- A. I, II and III
- B. I and III
- C. II and IV
- D. IV only
- E. I and II

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**29** Which statements are correct?

- I. Energy cannot be destroyed
- II. Energy cannot be created
- III. Sunlight is a form of energy
- IV. Living things move because sunlight gives them mechanical energy

- A. I, II and III
- B. I and III
- C. II and IV
- D. IV only
- E. III only

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**30** Choose the correct statement.

- A. A battery stores chemical energy
- B. A battery stores electrical energy

- C. A battery stores light energy
- D. A battery stores heat energy
- E. A battery does not store energy

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**31** A stone is thrown up into the air. What kind of energy does the stone possess when it is at its highest point?

- A. kinetic
- B. mechanical
- C. potential
- D. electrical
- E. none at all

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**32** What kind of energy does a falling stone have?

- A. kinetic
- B. mechanical
- C. potential
- D. heat
- E. sound

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

## Energy interconversions

In questions 33 - 57, give the energy change that takes place during the action or reaction.

**33** Teacher is filing a piece of metal.

- A. mechanical  $\rightarrow$  sound
- B. mechanical  $\rightarrow$  heat
- C. chemical  $\rightarrow$  heat + sound
- D. kinetic  $\rightarrow$  sound
- E. kinetic  $\rightarrow$  sound + heat

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**34** A bunsen flame is placed inside an iron tube from below so that a loud sound is produced.

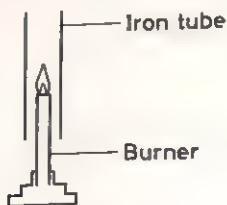


fig 11

- A. heat  $\rightarrow$  sound
- B. chemical  $\rightarrow$  sound
- C. chemical  $\rightarrow$  heat  $\rightarrow$  sound
- D. heat  $\rightarrow$  chemical  $\rightarrow$  sound
- E. heat  $\rightarrow$  potential  $\rightarrow$  sound

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

35 The circuit is set up and the bulb is lighted.

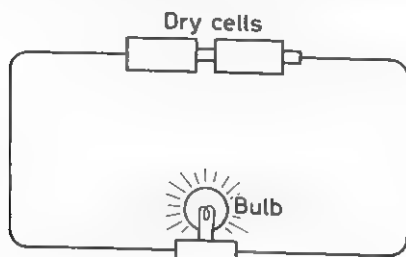


fig 12

- A. chemical  $\rightarrow$  electrical
- B. chemical  $\rightarrow$  electrical  $\rightarrow$  heat
- C. chemical  $\rightarrow$  electrical  $\rightarrow$  light
- D. chemical  $\rightarrow$  electrical  $\rightarrow$  heat + light
- E. electrical  $\rightarrow$  chemical  $\rightarrow$  heat + light

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

36 An iron nail is heated in a bunsen flame until it is red hot.

- A. chemical  $\rightarrow$  heat
- B. chemical  $\rightarrow$  light
- C. chemical  $\rightarrow$  heat  $\rightarrow$  light
- D. heat  $\rightarrow$  light  $\rightarrow$  chemical
- E. heat  $\rightarrow$  light  $\rightarrow$  electrical

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

37 The boy pulls the load, stops to rest and then lets go the rope.

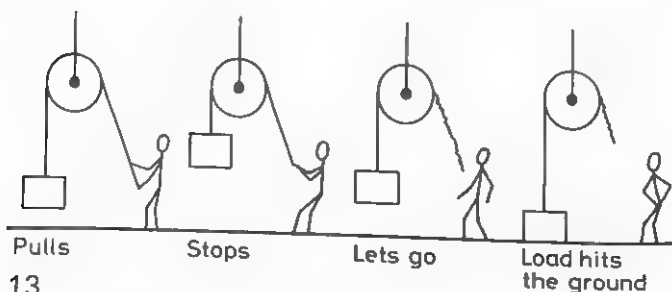


fig 13

- A. mechanical → kinetic → sound
- B. mechanical → potential → sound
- C. mechanical → kinetic → potential → sound
- D. kinetic → mechanical → potential → sound
- E. mechanical → potential → kinetic → sound

Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

**38** A tin containing small pieces of nails is shaken vigorously.

- A. mechanical → sound
- B. mechanical → kinetic
- C. mechanical → kinetic → sound
- D. kinetic → sound → mechanical
- E. kinetic → mechanical → sound

Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

**39** The water in the can is boiled in order to get steam to turn the wheel.

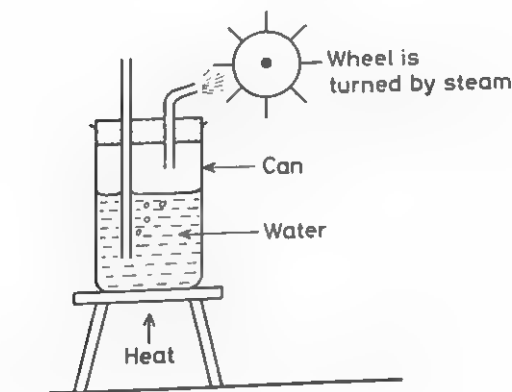


fig 14

- A. chemical → heat → potential → kinetic
- B. chemical → heat → kinetic
- C. chemical → heat → potential
- D. heat → potential → mechanical
- E. heat → kinetic → mechanical

Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

40 An alarm clock is wound up and it rings.

- A. mechanical  $\rightarrow$  sound
- B. mechanical  $\rightarrow$  potential  $\rightarrow$  sound
- C. kinetic  $\rightarrow$  sound
- D. kinetic  $\rightarrow$  potential  $\rightarrow$  sound
- E. potential  $\rightarrow$  sound  $\rightarrow$  mechanical

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

41 A few pellets of sodium hydroxide are put in a test tube containing water. The solution becomes warm.

- A. potential  $\rightarrow$  heat
- B. kinetic  $\rightarrow$  heat
- C. mechanical  $\rightarrow$  heat
- D. chemical  $\rightarrow$  heat
- E. chemical  $\rightarrow$  chemical

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

42 A small heap of ammonium dichromate is burnt.

- A. heat  $\rightarrow$  light  $\rightarrow$  sound
- B. heat  $\rightarrow$  light  $\rightarrow$  kinetic
- C. heat  $\rightarrow$  light  $\rightarrow$  sound + kinetic
- D. heat  $\rightarrow$  light  $\rightarrow$  potential + sound
- E. heat  $\rightarrow$  light  $\rightarrow$  kinetic + potential

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

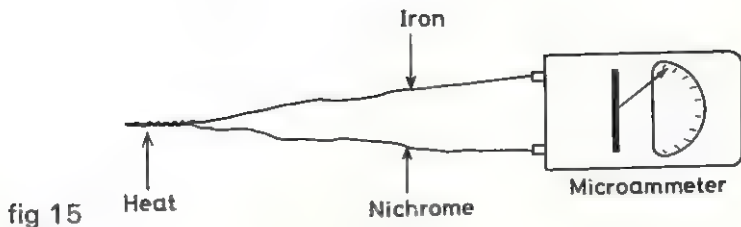
43 An accumulator is used to supply electricity to heat a coil of wire until it is red hot.

- A. chemical  $\rightarrow$  electrical  $\rightarrow$  heat
- B. chemical  $\rightarrow$  electrical  $\rightarrow$  heat  $\rightarrow$  light
- C. electrical  $\rightarrow$  chemical  $\rightarrow$  heat  $\rightarrow$  light
- D. electrical  $\rightarrow$  heat  $\rightarrow$  light
- E. electrical  $\rightarrow$  light  $\rightarrow$  heat

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

44 The two wires are connected to a microammeter. The free ends of the two wires are twisted together. The twisted end is heated by a bunsen flame, and the needle of the microammeter is observed to move.





- A. chemical  $\rightarrow$  heat  $\rightarrow$  electrical
- B. chemical  $\rightarrow$  heat  $\rightarrow$  kinetic
- C. chemical  $\rightarrow$  kinetic  $\rightarrow$  electrical
- D. chemical  $\rightarrow$  heat  $\rightarrow$  kinetic  $\rightarrow$  electrical
- E. chemical  $\rightarrow$  heat  $\rightarrow$  electrical  $\rightarrow$  kinetic

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

45 A battery is used to just about turn a motor.

- A. electrical  $\rightarrow$  kinetic
- B. chemical  $\rightarrow$  kinetic
- C. chemical  $\rightarrow$  electrical  $\rightarrow$  kinetic
- D. chemical  $\rightarrow$  heat  $\rightarrow$  kinetic
- E. chemical  $\rightarrow$  heat  $\rightarrow$  electrical

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

46 A plastic comb is vigorously rubbed with a piece of yellow cloth. When the rubbed comb is brought near small pieces of paper, the comb attracts the pieces of paper.

- A. mechanical  $\rightarrow$  electrical
- B. mechanical  $\rightarrow$  kinetic
- C. mechanical  $\rightarrow$  kinetic  $\rightarrow$  potential
- D. mechanical  $\rightarrow$  electrical  $\rightarrow$  kinetic
- E. mechanical  $\rightarrow$  electrical  $\rightarrow$  kinetic  $\rightarrow$  heat

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

47 A piece of iron which is tied to a rubber band is hung up. A boy pulls the iron down, holds on to it, and then lets go.

- A. mechanical  $\rightarrow$  potential  $\rightarrow$  kinetic
- B. mechanical  $\rightarrow$  kinetic  $\rightarrow$  potential
- C. potential  $\rightarrow$  mechanical  $\rightarrow$  kinetic
- D. mechanical  $\rightarrow$  kinetic
- E. potential  $\rightarrow$  kinetic

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- 48 When the circuit is completed, the bell rings.

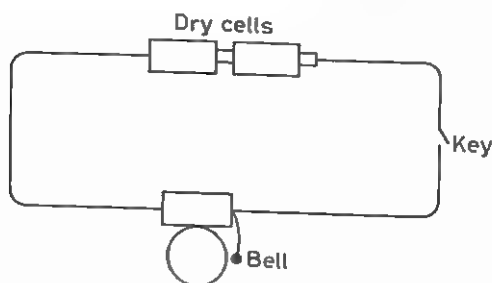


fig 16

- A. electrical  $\rightarrow$  kinetic  $\rightarrow$  sound
- B. electrical  $\rightarrow$  sound  $\rightarrow$  kinetic
- C. kinetic  $\rightarrow$  sound  $\rightarrow$  potential
- D. kinetic  $\rightarrow$  sound
- E. electrical  $\rightarrow$  sound

☐ A ☐ B ☐ C ☐ D ☐ E

- 49 A candle is burning.

- A. chemical  $\rightarrow$  light
- B. chemical  $\rightarrow$  heat
- C. chemical  $\rightarrow$  heat + light
- D. heat  $\rightarrow$  light + chemical
- E. heat  $\rightarrow$  light  $\rightarrow$  sound

☐ A ☐ B ☐ C ☐ D ☐ E

- 50 When a photocell is uncovered in sunlight, its needle is seen to move.

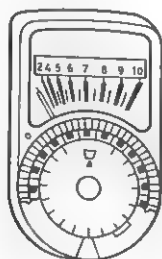


fig 17

- A. electrical  $\rightarrow$  kinetic
- B. electrical  $\rightarrow$  mechanical
- C. electrical  $\rightarrow$  light
- D. light  $\rightarrow$  kinetic
- E. light  $\rightarrow$  electrical

☐ A ☐ B ☐ C ☐ D ☐ E

**51** When an electric current from a battery is passed through a fuse wire, the wire becomes hot and melts.

- A. chemical  $\rightarrow$  electrical
- B. electrical  $\rightarrow$  heat
- C. chemical  $\rightarrow$  heat
- D. heat  $\rightarrow$  mechanical
- E. electrical  $\rightarrow$  mechanical

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**52** When a thermometer is placed near an electric bulb which is lighted, the temperature is seen to rise.

- A. electrical  $\rightarrow$  heat
- B. electrical  $\rightarrow$  light
- C. heat  $\rightarrow$  light
- D. electrical  $\rightarrow$  heat + kinetic
- E. electrical  $\rightarrow$  heat + light

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**53** Coal is used to boil water to get steam in order to operate a generator, which produces electricity.

- A. chemical  $\rightarrow$  heat  $\rightarrow$  electrical
- B. mechanical  $\rightarrow$  chemical  $\rightarrow$  heat
- C. mechanical  $\rightarrow$  heat  $\rightarrow$  chemical  $\rightarrow$  electrical
- D. chemical  $\rightarrow$  heat  $\rightarrow$  kinetic  $\rightarrow$  electrical
- E. chemical  $\rightarrow$  mechanical  $\rightarrow$  heat  $\rightarrow$  electrical

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**54** The back wheel of a bicycle is turned so that light is produced.

- A. mechanical  $\rightarrow$  kinetic  $\rightarrow$  electrical  $\rightarrow$  light
- B. mechanical  $\rightarrow$  electrical  $\rightarrow$  kinetic  $\rightarrow$  light
- C. mechanical  $\rightarrow$  electrical  $\rightarrow$  light
- D. electrical  $\rightarrow$  light
- E. kinetic  $\rightarrow$  light

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

55 A catapult is used to hit a bird.

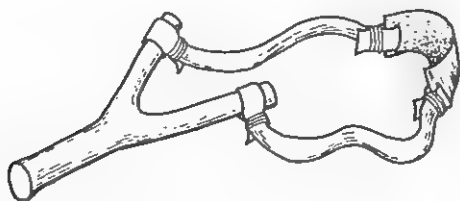


fig 18

- A. mechanical  $\rightarrow$  kinetic
- B. mechanical  $\rightarrow$  kinetic  $\rightarrow$  potential
- C. mechanical  $\rightarrow$  potential  $\rightarrow$  kinetic
- D. kinetic  $\rightarrow$  potential  $\rightarrow$  sound
- E. potential  $\rightarrow$  kinetic  $\rightarrow$  sound

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

56 A battery is used to pass an electric current through copper chloride solution so that the solution is split into copper and chlorine.

- A. electrical  $\rightarrow$  chemical
- B. chemical  $\rightarrow$  electrical
- C. chemical  $\rightarrow$  electrical  $\rightarrow$  chemical
- D. electrical  $\rightarrow$  chemical  $\rightarrow$  electrical
- E. chemical  $\rightarrow$  electrical  $\rightarrow$  heat  $\rightarrow$  chemical

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

57 A ball is rolling down a slope.

- A. mechanical  $\rightarrow$  kinetic
- B. kinetic  $\rightarrow$  mechanical
- C. potential  $\rightarrow$  heat
- D. kinetic  $\rightarrow$  potential
- E. potential  $\rightarrow$  kinetic

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

## Energy converters in action

58 Methylated spirit is burnt to produce steam in order to turn the flywheels which turn the shaft and lift the weight.

What energy change takes place?

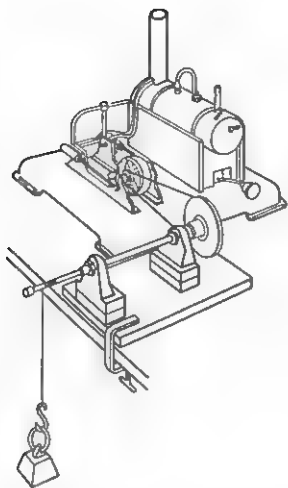


fig 19

- A. chemical  $\rightarrow$  heat  $\rightarrow$  kinetic  $\rightarrow$  potential
- B. chemical  $\rightarrow$  kinetic  $\rightarrow$  heat  $\rightarrow$  potential
- C. heat  $\rightarrow$  kinetic  $\rightarrow$  potential
- D. heat  $\rightarrow$  potential  $\rightarrow$  kinetic
- E. kinetic  $\rightarrow$  mechanical  $\rightarrow$  potential

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**59** Methylated spirit is burnt in order to produce steam to turn the flywheel, which then drives the generator. The generator produces electricity to light the lamp.

What energy change takes place?

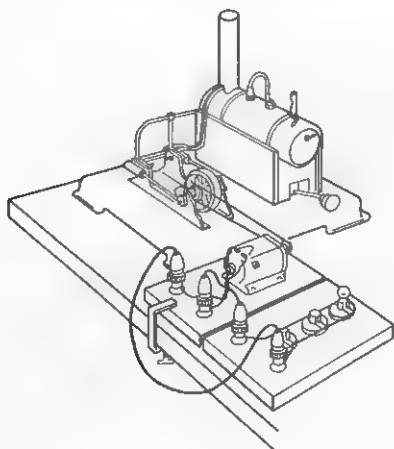


fig 20

- A. kinetic  $\rightarrow$  electrical  $\rightarrow$  heat
- B. kinetic  $\rightarrow$  electrical  $\rightarrow$  heat + light
- C. heat  $\rightarrow$  electrical  $\rightarrow$  heat + light
- D. chemical  $\rightarrow$  heat  $\rightarrow$  kinetic  $\rightarrow$  heat + light
- E. chemical  $\rightarrow$  heat  $\rightarrow$  kinetic  $\rightarrow$  electrical  $\rightarrow$  heat + light

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

60 Question 59 illustrates how a . . . . . works.

- A. hydroelectric power station
- B. power station
- C. pile driver
- D. flywheel
- E. electric motor

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

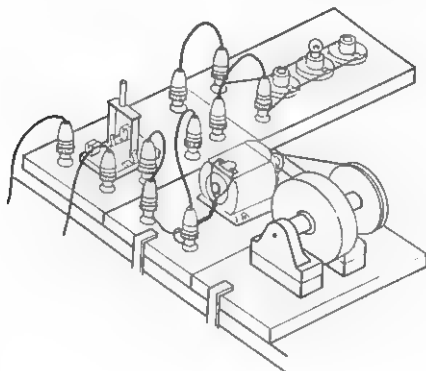


fig 21

61 Dry cells are used to supply electricity to drive the motor in order to turn the flywheel. Give the energy change that takes place.

- A. electrical  $\rightarrow$  kinetic
- B. chemical  $\rightarrow$  electrical
- C. chemical  $\rightarrow$  kinetic  $\rightarrow$  electrical
- D. chemical  $\rightarrow$  electrical  $\rightarrow$  kinetic
- E. chemical  $\rightarrow$  electrical  $\rightarrow$  potential

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- 62 The flywheel is kept running in the above experiment. The two-way switch is turned on so that the moving flywheel drives the generator to produce electricity to light the lamp. Give the energy change that takes place during this second part of the operation.

- A. electrical  $\rightarrow$  kinetic  $\rightarrow$  heat
- B. kinetic  $\rightarrow$  electrical  $\rightarrow$  light
- C. kinetic  $\rightarrow$  electrical  $\rightarrow$  heat + light
- D. potential  $\rightarrow$  kinetic  $\rightarrow$  heat + light
- E. electrical  $\rightarrow$  heat  $\rightarrow$  light

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

- 63 A battery is used to supply an electric current to turn the motor. The motor drives the flywheel which turns the shaft and lifts the load. What energy conversion takes place?

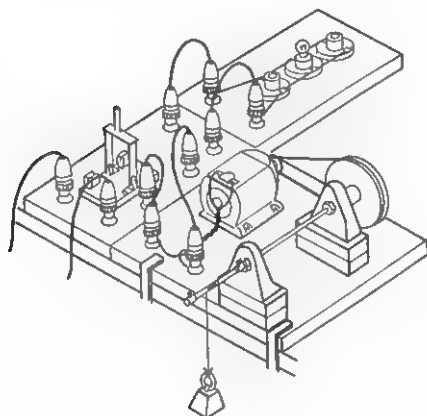


fig 22

- A. chemical  $\rightarrow$  electrical  $\rightarrow$  kinetic  $\rightarrow$  potential
- B. chemical  $\rightarrow$  electrical  $\rightarrow$  potential
- C. chemical  $\rightarrow$  electrical  $\rightarrow$  mechanical
- D. electrical  $\rightarrow$  kinetic  $\rightarrow$  chemical
- E. kinetic  $\rightarrow$  electrical  $\rightarrow$  kinetic

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

- 64 In the above experiment, the two-way switch is turned on so that the load falls and turns the flywheel, which drives the generator and produces an electric current to light the lamp. What energy change takes place during this second part?

- A. kinetic  $\rightarrow$  heat
- B. kinetic  $\rightarrow$  electrical  $\rightarrow$  heat
- C. potential  $\rightarrow$  kinetic  $\rightarrow$  electrical  $\rightarrow$  heat + light
- D. electrical  $\rightarrow$  kinetic  $\rightarrow$  heat + light
- E. potential  $\rightarrow$  electrical  $\rightarrow$  heat + light

☐ A ☐ B ☐ C ☐ D ☐ E

- 65 Tap water is used to turn the turbine. The turbine drives the generator which produces electricity to light the lamp.

Give the energy conversion which takes place.

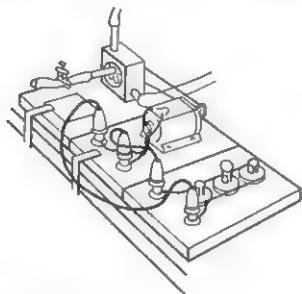


fig 23

- A. kinetic  $\rightarrow$  heat
- B. kinetic  $\rightarrow$  electrical  $\rightarrow$  light
- C. kinetic  $\rightarrow$  electrical  $\rightarrow$  heat
- D. kinetic  $\rightarrow$  kinetic  $\rightarrow$  electrical
- E. kinetic  $\rightarrow$  electrical  $\rightarrow$  heat + light

☐ A ☐ B ☐ C ☐ D ☐ E

- 66 The model in question 65 shows the principle of the

- A. power station
- B. hydroelectric power station
- C. pumping station
- D. dynamo
- E. pile driver

☐ A ☐ B ☐ C ☐ D ☐ E



- 67 A battery is used to supply an electric current to turn the motor. The motor then turns the pump which raises the water. Give the energy change which takes place.

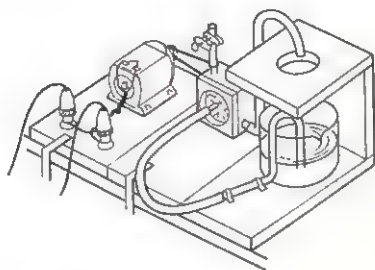


fig 24

- A. electrical  $\rightarrow$  kinetic  $\rightarrow$  potential  
 B. electrical  $\rightarrow$  kinetic  $\rightarrow$  kinetic  
 C. chemical  $\rightarrow$  kinetic  $\rightarrow$  kinetic  
 D. chemical  $\rightarrow$  electrical  $\rightarrow$  kinetic  $\rightarrow$  potential  
 E. chemical  $\rightarrow$  electrical  $\rightarrow$  potential  $\rightarrow$  mechanical

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- 68 The two-way switch is turned on so that an electric current is passed into the lead plates which are dipped in dilute sulphuric acid. This is allowed to go on for sometime in order to charge the storage battery. What energy conversion takes place?

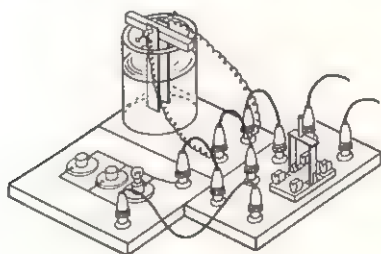


fig 25

- A. electrical  $\rightarrow$  chemical  
 B. chemical  $\rightarrow$  electrical  
 C. kinetic  $\rightarrow$  chemical  
 D. chemical  $\rightarrow$  potential  
 E. electrical  $\rightarrow$  potential

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

69 In the above experiment, the two-way switch is then turned the other way so that the charged storage battery is made use of to light the lamp. What energy change takes place during this second part?

- A. electrical  $\rightarrow$  heat
- B. electrical  $\rightarrow$  light
- C. electrical  $\rightarrow$  heat + light
- D. chemical  $\rightarrow$  electrical  $\rightarrow$  light
- E. chemical  $\rightarrow$  electrical  $\rightarrow$  heat + light

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

70 A battery supplied an electric current to turn the motor. Using a belt drive, the motor is made to turn the brass cylinder which is in constant contact with the friction brake. The friction brake produces heat which warms the water in the cylinder. The rise in temperature of the water is indicated by the thermometer. Give the energy change that takes place.

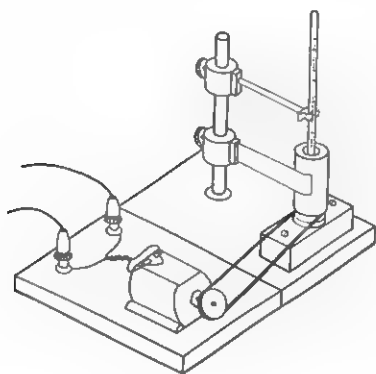


fig 26

- A. kinetic  $\rightarrow$  heat  $\rightarrow$  chemical
- B. electrical  $\rightarrow$  kinetic  $\rightarrow$  heat
- C. chemical  $\rightarrow$  electrical  $\rightarrow$  kinetic  $\rightarrow$  heat
- D. electrical  $\rightarrow$  chemical  $\rightarrow$  kinetic  $\rightarrow$  heat
- E. electrical  $\rightarrow$  kinetic  $\rightarrow$  heat  $\rightarrow$  mechanical

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- 71** In a diesel-electric locomotive, the diesel engine drives the generator. The generator produces electricity which turns the motors that move the locomotive.

What energy change takes place?

- A. heat  $\rightarrow$  electrical  $\rightarrow$  kinetic
- B. chemical  $\rightarrow$  heat  $\rightarrow$  electrical  $\rightarrow$  kinetic
- C. chemical  $\rightarrow$  heat  $\rightarrow$  kinetic  $\rightarrow$  electrical
- D. heat  $\rightarrow$  chemical  $\rightarrow$  electrical  $\rightarrow$  kinetic
- E. electrical  $\rightarrow$  chemical  $\rightarrow$  heat  $\rightarrow$  kinetic

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

- 72** A spring is wound up fully. The spring is then allowed to unwind itself so that it can turn a dynamo to produce electricity to light a lamp.
- What sort of energy change takes place?

- A. kinetic  $\rightarrow$  electrical  $\rightarrow$  light
- B. kinetic  $\rightarrow$  electrical  $\rightarrow$  heat
- C. kinetic  $\rightarrow$  electrical  $\rightarrow$  heat + light
- D. mechanical  $\rightarrow$  potential  $\rightarrow$  electrical  $\rightarrow$  heat + light
- E. mechanical  $\rightarrow$  potential  $\rightarrow$  kinetic  $\rightarrow$  electrical  $\rightarrow$  heat + light

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

## Energy and living things

- 73** Green leaves are important to a plant because they

- A. contain pores
- B. take in oxygen
- C. give out water vapour
- D. can get energy from the sun
- E. make the earth a more beautiful place

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

- 74** Green plants in sunlight change carbon dioxide and water into food.
- What energy change takes place?

- A. light → chemical
- B. heat → chemical
- C. chemical → light
- D. chemical → heat
- E. light → heat

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

- 75 When food is eaten it is changed back into water and carbon dioxide. The food is also used to keep man warm and give him the ability to work and play.

What energy change is involved?

- A. chemical → heat
- B. chemical → mechanical
- C. chemical → heat + mechanical
- D. light → heat + mechanical
- E. light → heat → mechanical

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

- 76 Living things require food in order to get

- A. water
- B. carbon dioxide
- C. oxygen
- D. carbon
- E. energy

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

- 77 Organic substances are substances which come from

- A. plants and animals
- B. plants only
- C. animals only
- D. sunlight
- E. minerals

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

- 78 What substance is found in all organic matter?

- A. air
- B. oxygen
- C. water
- D. carbon
- E. organs

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

## 4 Matter as particles

---

### Evidence for the fine division of matter

1 Which state or states of matter have a regular shape?

- A. solid
- B. liquid
- C. gaseous
- D. solid and liquid
- E. liquid and gaseous

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

2 Which state or states of matter always occupy the whole space of the container?

- A. solid
- B. liquid
- C. gaseous
- D. solid and liquid
- E. liquid and gaseous

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

3 What happens when the gas jar cover is removed?

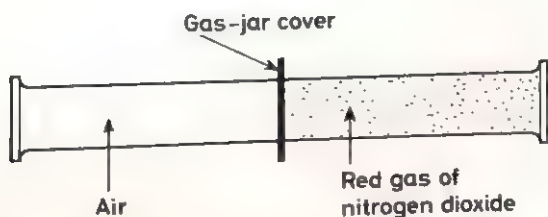


fig 27

- A. The red gas will move into the jar of air
- B. The red gas will remain in its own jar
- C. The red gas will combine with the air to form a new substance
- D. The red gas will become colourless, like air
- E. The red gas will turn dark brown

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

4 The experiment in question 3 above illustrates

- A. the structure of matter
- B. the dilution of gases
- C. the combination of gases
- D. the force of attraction by gravity
- E. diffusion in gases

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

5 For the experiment illustrated in question 3 above, pupils from a class suggested the following explanations for their observation. Which of the suggestions are reasonable explanations when considering this experiment alone?

- I. The gases are made up of tiny particles which are constantly moving about
- II. The gases are made up of motionless particles
- III. The gases are made up of a substance similar to a thin sheet of elastic rubber which can be easily stretched
- IV. The gases are made up of a substance similar to a piece of cotton gauze which has many holes but which can be stretched readily

- A. I, II and III
- B. II, III and IV
- C. I, II and IV
- D. I, III and IV
- E. II only

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

6 Three balloons of the same type were used for this experiment. One balloon was filled with hydrogen, one was filled with carbon dioxide, and one was filled with air, to the same size. All three balloons were tested under

water and were found not to leak. They were then hung up. After a few hours it was observed that the balloons had become smaller. The balloon containing hydrogen was the smallest.

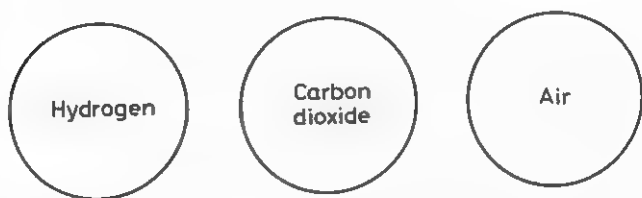


fig 28

The pupils in a class gave four suggestions to explain what happened in the experiment. Which of the suggestions explain what took place?

- I. The gases are made up of tiny particles which are always moving about
- II. The gases are made up of tiny particles which do not move about
- III. The gases are made of a substance similar to a thin sheet of elastic rubber
- IV. The gases are made of a substance similar to a piece of cotton gauze which can be stretched

- A. I only
- B. II only
- C. III and IV
- D. I, III and IV
- E. II, III and IV

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

7 Consider only the balloon experiment of question 6.

Which of the following are reasonable suggestions to explain why the balloon with hydrogen became much smaller than the one with air?

- I. Hydrogen particles move faster than air particles
- II. Hydrogen particles are heavier than air particles
- III. Hydrogen particles are smaller than air particles

IV. There are less hydrogen particles than air particles

- A. I, II and III
- B. I and III
- C. II and IV
- D. I and IV
- E. I, III and IV

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- 8 The top jar contains a dark brown gas called nitrogen dioxide, and the bottom jar contains air. When the gas jar cover is removed it is observed that after sometime the nitrogen dioxide gas goes down to the bottom jar and the air is displaced upwards into the top jar. Nitrogen dioxide and air do not mix or diffuse completely. Why?

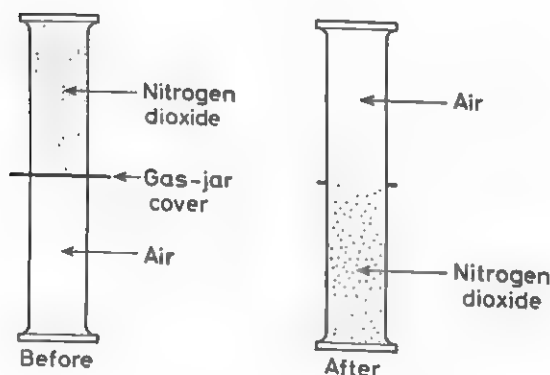


fig 29

- A. Air always moves upwards
- B. Air is already a mixture of many gases
- C. Nitrogen dioxide cannot diffuse with air
- D. Nitrogen dioxide particles are heavier than air particles
- E. Nitrogen dioxide particles are attracted by the force of gravity but air particles are not

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~



- 9 When hydrogen sulphide, a gas which has a very bad smell, is set free at one end of a room its smell is soon detected throughout the room.

What does this show?

- A. Hydrogen sulphide is made up of tiny particles which are motionless
- B. Hydrogen sulphide cannot be made up of tiny particles
- C. Hydrogen sulphide particles move quickly through the air
- D. Hydrogen sulphide particles are lighter than air particles
- E. Hydrogen sulphide particles combine with air particles

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- 10 What happens when the clip is open?

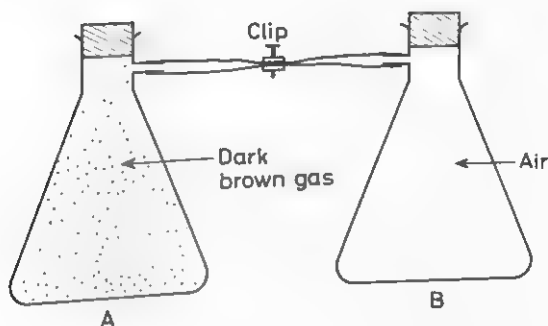


fig 30

- A. The dark brown gas rushes into flask B at once
- B. The dark brown gas slowly moves into flask B
- C. The dark brown gas does not move into flask B at all
- D. The air from flask B rushes into flask A at once
- E. None of the observations is correct

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- 11 Choose the correct statements to show what happens when the clip is open.

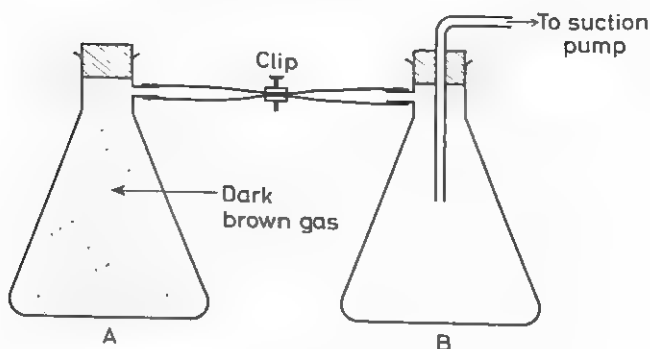


fig 31

- I. The dark brown gas does not move into flask B
- II. The dark brown gas slowly moves into flask B
- III. The dark brown gas rushes into flask B at once
- IV. The dark brown gas goes into flask B because the pressure in flask B is high
- V. The dark brown gas goes into flask B because the pressure in flask B is very low

- A. I and IV
- B. I and V
- C. II and IV
- D. II and V
- E. III and V

☐A: ☐B: ☐C: ☐D: ☐E:

- 12 Scientists have found an explanation for the behaviour of gases. They have come to the conclusion that

- A. gases are made up of tiny particles
- B. gases are made up of tiny particles which do not move about
- C. gases are made up of tiny particles which are always moving about and colliding with each other
- D. gases are made up of thin thread-like substances
- E. gases are made of a thin elastic substance

☐A: ☐B: ☐C: ☐D: ☐E:

- 13 At the beginning of the experiment the gas jar contains a layer of strong copper sulphate solution at the bottom and a layer of water at the top.  
What will gradually happen?

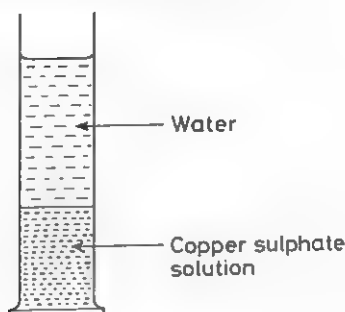


fig 32

- A. The copper sulphate solution will not mix with the water
- B. The copper sulphate solution will mix with the water
- C. The layer of copper sulphate solution will rise to the top and the layer of water will sink to the bottom
- D. The copper sulphate solution will combine with the water to form a solid
- E. The copper sulphate solution will combine with the water to form a new solution

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- 14 The experiment in question 13 illustrates the process of ..... in liquids.

- A. precipitation
- B. combination
- C. expansion
- D. diffusion
- E. filtration

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- 15 A crystal of potassium dichromate is placed at the bottom of a beaker of water. Later a yellow solution is seen to gradually spread upwards.

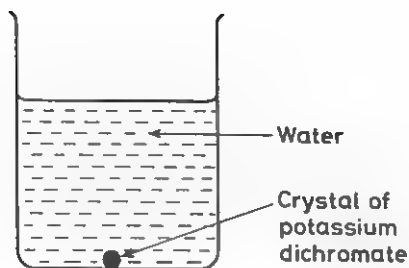


fig 33

Which statement below explains correctly what happens?

- A. The particles from the crystal are lighter than the particles of water, and therefore they move up the water
- B. The particles of water are heavier than the particles from the crystal, and therefore they sink to the bottom pushing up the particles from the solid
- C. The particles from the crystal move out and join up with the particles of water
- D. The particles from the crystal join up with the particles of water and move about together
- E. The particles from the crystal move out and fit into the spaces in between the particles of water

☐ A ☐ B ☐ C ☐ D ☐ E

- 16 A crystal of potassium dichromate is placed in a test tube which is filled with gel. The test tube is placed on its side. What happens after a few days?

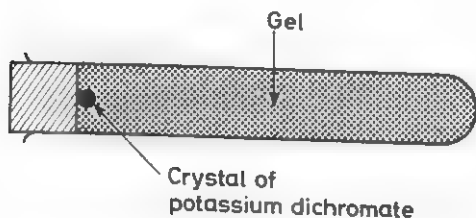


fig 34

- A. The crystal just melts
- B. The crystal becomes smaller
- C. The crystal stains the lower half of the test tube yellow
- D. The crystal melts and its yellow colour is spread throughout the gel
- E. The crystal melts and its yellow colour spreads upwards only

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

17 Which is a possible explanation for what happens in the experiment described in question 16 above?

- A. The particles of potassium dichromate move out and fit into the spaces in between the particles of gel
- B. The particles of potassium dichromate are attracted by gravity, and therefore they move downwards only
- C. The particles of potassium dichromate are small and light and therefore they move upwards only
- D. The potassium dichromate melts because the gel contains water
- E. The potassium dichromate slowly evaporates away

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

18 Copper sulphate crystals dissolve faster in hot water than in cold water because

- A. at a higher temperature, the copper sulphate particles give out their colour faster
- B. at a higher temperature, the copper sulphate particles absorb water faster
- C. at a higher temperature, the copper sulphate particles have more energy and move out faster through the water
- D. hot water has more spaces for the copper sulphate particles to move through
- E. copper sulphate does not dissolve in cold water

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**19** A crystal of potassium permanganate is placed in a large beaker and water is added slowly until the purple colour of the potassium permanganate almost disappears.

Considering this experiment alone, which of the following statements are possible explanations of what happens to the crystal as it dissolves in the water and its solution becomes diluted?

- I. The crystal colours the particles of water but itself remains unchanged
- II. The crystal breaks up into tiny particles which spread themselves through the water
- III. The crystal stretches itself like a thin sheet of rubber

- A. I only
- B. II only
- C. III only
- D. I and II
- E. II and III

☐A: ☐B: ☐C: ☐D: ☐E:

**20** 100 ml of alcohol were mixed with 100 ml of water. The final volume of the mixture was only 195 ml.

How can this be explained?

- A. The alcohol particles became smaller
- B. The water particles became smaller
- C. The alcohol particles and the water particles combine together
- D. The alcohol particles and the water particles move into the spaces between themselves
- E. The water particles are heavier and they sink to the bottom

☐A: ☐B: ☐C: ☐D: ☐E:

**21** 20 ml of common salt are mixed with 50 ml of water. The final volume of the mixture is expected to be

- A. 70 ml
- B. less than 70 ml
- C. more than 70 ml
- D. dependent on whether the common salt is wet or dry
- E. dependent on whether the water is hot or cold

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**22** How can the result in the experiment of question 21 be explained?

- A. The particles of common salt and the particles of water remain the same size
- B. The common salt particles become smaller
- C. The common salt particles absorb water and become bigger
- D. The common salt particles dissolve in the water
- E. The common salt particles move into the spaces between the water particles

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**23** Powder is lightly sprinkled on the surface of a tray of clean water. Then, using a thin loop of wire, a tiny drop of olive oil is placed in the middle of the water.  
What happens?

- A. The oil drop just floats on the water
- B. The oil spreads out quickly over a large area
- C. The oil sinks in the water
- D. The oil drop breaks up into a few droplets
- E. The powder clusters round the drop of oil

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**24** In the experiment described in question 23, how thick is the thinnest possible layer of oil film?

- A. one particle thick
- B. two particles thick
- C. three particles thick
- D. more than one particle thick
- E. more than two particles thick

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**25** Which statement below is the experiment in question 23 meant to illustrate?

- A. Oil cannot mix with water
- B. Oil is made up of particles
- C. The oil particles must be very very tiny
- D. Oil floats on water
- E. Oil may sink in water

☐A: ☐B: ☐C: ☐D: ☐E:

**26** When is a smoke cell used?

- A. When we want to see particles of smoke moving about
- B. When we want to see molecules of smoke moving about
- C. When we want to see atoms of smoke moving about
- D. When we want to show that matter is made up of particles
- E. When we want to show that the particles in a liquid are closer than the particles in a gas

☐A: ☐B: ☐C: ☐D: ☐E:

**27** A short glass cylinder containing smoke is covered with a thin transparent microscope cover-slip. A strong source of light is shone on the cylinder, so that a beam of light passes through the cylinder. The smoke is viewed from the top through a microscope which has a suitable magnification.

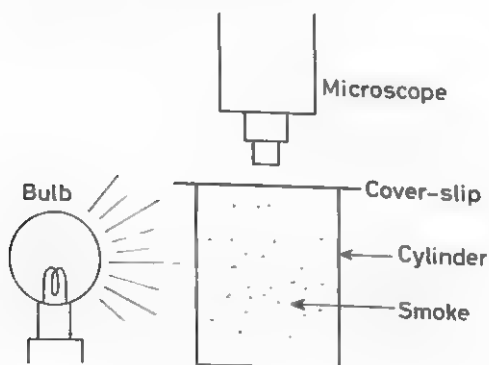


fig 35



What will a student observe if he looks into the microscope that has been correctly focussed?

- A. He will see black particles of smoke
- B. He will see bright, motionless particles of smoke
- C. He will see bright smoke particles dashing about
- D. He will see smoke particles and air particles colliding with each other
- E. He will see the smoke particles joining up with the air particles

☐A ☐B ☐C ☐D ☐E

**28** The movement of the smoke particles seen in the above experiment is called

- A. diffusion
- B. filtration
- C. precipitation
- D. the force of gravity
- E. the Brownian movement

☐A ☐B ☐C ☐D ☐E

**29** The movement of the smoke particles in the above experiment is due to

- A. the particles of smoke moving on their own
- B. the particles of air knocking the particles of smoke about
- C. light energy from the source of strong light
- D. collision of the smoke particles against the wall of the cylinder
- E. a chemical reaction between the smoke particles and the air particles

☐A ☐B ☐C ☐D ☐E

**30** After many experiments scientists have come to the conclusion that

- A. the particles which make up iron are the same as those which make up copper
- B. the particles in all substances are of the same size
- C. the particles in all substances move at the same speed

- D. matter is made up of very tiny particles
- E. matter is made up of a substance like very stretchy rubber

☐ A ☐ B ☐ C ☐ D ☐ E

**31** Choose the statements which are true.

- I. The particles that make up different substances may be of different sizes
- II. The particles in liquids do not knock against each other
- III. The particles in solids are always vibrating
- IV. The particles in gases are always moving about and colliding with each other

- A. I, II and III
- B. II, III and IV
- C. I, III and IV
- D. I and III
- E. II and IV

☐ A ☐ B ☐ C ☐ D ☐ E

**32** Which statements are incorrect?

- I. The particles in liquids are more closely packed than those in solids
- II. The particles of different substances move or vibrate at different speeds
- III. The particles which make up oxygen are the same as those which make up hydrogen since they are both gases
- IV. The particles in gases are very far apart from each other

- A. I and III
- B. II and III
- C. II and IV
- D. III and IV
- E. I only

☐ A ☐ B ☐ C ☐ D ☐ E

**33** In which substance are the particles most closely packed?

- A. water

- B. air
- C. sheet of gold leaf
- D. sheet of elastic rubber
- E. sheet of glass

~~==A==~~   ~~==B==~~   ~~==C==~~   ~~==D==~~   ~~==E==~~

## Structure of matter

**34** Which of these properties apply to all metals?

- I. They are magnetic
- II. They allow electricity to pass through them
- III. They dissolve in nitric acid
- IV. They have a shiny appearance

- A. I, II and III
- B. I and III
- C. II and IV
- D. I and II
- E. IV only

~~==A==~~   ~~==B==~~   ~~==C==~~   ~~==D==~~   ~~==E==~~

**35** Which statements are true for metals?

- I. They can be beaten into thin sheets
- II. They rust
- III. They can be drawn into wires
- IV. They allow heat to pass through them

- A. I, II and III
- B. I and III
- C. II and IV
- D. IV only
- E. I, III and IV

~~==A==~~   ~~==B==~~   ~~==C==~~   ~~==D==~~   ~~==E==~~

**36** Of the following statements only one is false.  
Choose the false statement.

- A. Metals give a metallic sound
- B. Metals are heavy

- C. Some metals do not rust
- D. All metals are solids at room temperature
- E. All metals conduct electricity

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**37** Name the metal which is a liquid at ordinary room temperature.

- A. iron
- B. mercury
- C. copper
- D. gold
- E. silver

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**38** Which of these properties apply to all non-metals?

- I. They dissolve in water
- II. They are non-magnetic
- III. They melt when they are heated
- IV. They are usually lighter than metals

- A. I, II and III
- B. I and III
- C. II and IV
- D. IV only
- E. II only

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**39** Which property is not true for sulphur?

- A. It conducts electricity
- B. It does not dissolve in water
- C. It gives out a smell
- D. It is non-magnetic
- E. It is yellow

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**40** Choose the descriptions which are correct for non-metals.

- I. They have a dull appearance
- II. They are usually bad conductors of heat
- III. They are usually lighter than metals

IV. They always allow electricity to pass through them

- A. I, II and III
- B. I and III
- C. II and IV
- D. IV only
- E. III only

☐A: ☐B: ☐C: ☐D: ☐E:

41 What is an atom?

- A. It is the smallest particle of a compound
- B. It is the smallest particle of an element
- C. It is the smallest particle of a crystal
- D. It is the smallest particle of a mixture
- E. It is the smallest particle of a metal

☐A: ☐B: ☐C: ☐D: ☐E:

42 One molecule of a compound consists of

- A. only one kind of atom joined together
- B. only two different atoms joined together
- C. at least two different atoms joined together
- D. three different atoms joined together
- E. more than two different atoms joined together

☐A: ☐B: ☐C: ☐D: ☐E:

43 When atoms from two different substances join together

- A. a compound is made
- B. an element is made
- C. a mixture is made
- D. new atoms are made
- E. the atoms change their shape

☐A: ☐B: ☐C: ☐D: ☐E:

44 A molecule is made up of

- A. heat energy
- B. chemical energy
- C. elements

- D. compounds
- E. atoms

☐A: ☐B: ☐C: ☐D: ☐E:

**45** What is an element?

- A. It is a substance which can combine with another substance
- B. It is a substance which can be separated into simpler substances
- C. It is a substance made up of molecules
- D. It is a substance made up of more than two kinds of atoms
- E. It is a substance made up of only one kind of atom

☐A: ☐B: ☐C: ☐D: ☐E:

**46** Which is an element?

- A. copper sulphate
- B. barium chloride
- C. common salt
- D. iron
- E. sugar

☐A: ☐B: ☐C: ☐D: ☐E:

**47** Choose the elements from the list.

- I. mercury
- II. flour
- III. copper
- IV. wax

- A. II, III and IV
- B. I and III
- C. II and IV
- D. I only
- E. III only

☐A: ☐B: ☐C: ☐D: ☐E:

**48** Choose the elements which are not metals.

- I. acid
- II. mercury
- III. alcohol
- IV. sulphur

- A. I and III
- B. II and IV
- C. II only
- D. IV only
- E. none of these combinations

☐A: ☐B: ☐C: ☐D: ☐E:

**49** The smallest particle of a piece of iron is called

- A. a molecule
- B. an atom
- C. an element
- D. a compound
- E. a crystal

☐A: ☐B: ☐C: ☐D: ☐E:

**50** The smallest particle of sulphur is

- A. one molecule
- B. one atom
- C. one element
- D. one compound
- E. one crystal

☐A: ☐B: ☐C: ☐D: ☐E:

**51** A substance which consists of two or more elements in combination is called

- A. a crystal
- B. a mixture
- C. a molecule
- D. an atom
- E. a compound

☐A: ☐B: ☐C: ☐D: ☐E:

**52** The smallest particle from a piece of copper sulphate is

- A. one molecule
- B. one atom
- C. one element
- D. one crystal
- E. one compound

☐A: ☐B: ☐C: ☐D: ☐E:

**53** The tiniest particle of common salt is called

- A. an element
- B. a compound
- C. a crystal
- D. a molecule
- E. an atom

☐ A ☐ B ☐ C ☐ D ☐ E

**54** Copper is an element. If the smallest possible copper particle is split, which statement below is correct?

- A. The split particles do not have the properties of copper
- B. The split particles still have the properties of copper
- C. The split particles become atoms of copper
- D. The split particles become molecules of copper
- E. The split particles become elements of copper

☐ A ☐ B ☐ C ☐ D ☐ E

**55** What is one molecule of copper sulphate?

- A. It contains only one kind of atom
- B. It is made up of one atom of copper and one atom of sulphur
- C. It is made up of one atom of copper, one atom of sulphur and one atom of oxygen
- D. It is the smallest piece of copper sulphate
- E. It is the largest piece of copper sulphate crystal

☐ A ☐ B ☐ C ☐ D ☐ E

**56** What is a compound?

- A. It is a substance made up of one kind of atom
- B. It is a substance made up of two atoms
- C. It is a substance made up of at least two elements chemically combined together
- D. It is a substance made up of two kinds of molecules
- E. It is a mixture of two or more substances

☐ A ☐ B ☐ C ☐ D ☐ E



**57** Choose the compounds from the list.

- I. iodine
- II. water
- III. air
- IV. common salt

- A. I, II and III
- B. I and III
- C. II and IV
- D. III only
- E. IV only

☐ A ☐ B ☐ C ☐ D ☐ E

**58** Which statements are true?

- I. A molecule from a compound always consists of at least two atoms
- II. A molecule from a compound always consists of at least three atoms
- III. An atom is the smallest particle of a compound
- IV. An atom is the smallest particle of an element

- A. I and III
- B. II and IV
- C. I and IV
- D. II and III
- E. IV only

☐ A ☐ B ☐ C ☐ D ☐ E

**59** Choose the statements which are correct.

- I. A compound cannot be split into simpler substances
- II. A compound can be split into simpler substances
- III. An element cannot be split into simpler substances
- IV. An element can be split into simpler substances

- A. I and III
- B. I and IV
- C. II and III
- D. II and IV
- E. none of these combinations

☐ A ☐ B ☐ C ☐ D ☐ E

Matching questions 60 - 62 are numbered statements. They are preceded by a five lettered heading. For each statement, select the word in the heading which is most clearly related to it.

*Heading*

- A. elements
- B. compounds
- C. mixtures
- D. molecules
- E. atoms

*Statements*

**60** All substances are made up of these.

☐A ☐B ☐C ☐D ☐E

**61** Copper chloride is an example of these.

☐A ☐B ☐C ☐D ☐E

**62** These are the smallest parts of salt which can exist by themselves and keep the same properties.

☐A ☐B ☐C ☐D ☐E

**63** A suitable mixture of copper powder and sulphur powder is heated in a test tube. What happens?

- A. A compound is formed
- B. An element is formed
- C. A mixture is formed
- D. The sulphur combines with oxygen
- E. The copper combines with oxygen

☐A ☐B ☐C ☐D ☐E

**64** During the above experiment

- A. chemical energy is given out
- B. chemical energy is taken in
- C. light energy is taken in
- D. heat energy is taken in
- E. heat energy is given out

☐A ☐B ☐C ☐D ☐E

- 65** How many elements does the new substance produced in the above experiment contain?
- A. no element
  - B. one element
  - C. two elements
  - D. three elements
  - E. more than two elements
- ~~..A:~~ ~~..B:~~ ~~..C:~~ ~~..D:~~ ~~..E:~~
- 66** In question 63, to get back the copper and sulphur separately from the new substance just
- A. pound the new substance
  - B. dissolve the new substance in water
  - C. use mechanical energy
  - D. take away energy
  - E. supply energy
- ~~..A:~~ ~~..B:~~ ~~..C:~~ ~~..D:~~ ~~..E:~~
- 67** A mixture of iron filings and sulphur powder is strongly heated.  
What is formed?
- A. iron sulphide
  - B. iron sulphate
  - C. iron oxide
  - D. iron rust
  - E. sulphur rock
- ~~..A:~~ ~~..B:~~ ~~..C:~~ ~~..D:~~ ~~..E:~~
- 68** During the experiment of question 67 what energy is given out?
- A. chemical
  - B. heat
  - C. mechanical
  - D. sound
  - E. kinetic
- ~~..A:~~ ~~..B:~~ ~~..C:~~ ~~..D:~~ ~~..E:~~
- 69** In question 67, to get back the iron and the sulphur just

- A. heat the substance in water
- B. filter
- C. dissolve the substance in water
- D. supply energy
- E. take away energy

☐A: ☐B: ☐C: ☐D: ☐E:

**70** What happens when a piece of very thin copper foil is placed in a jar of chlorine?

- A. The atoms of the substances combine to form a compound
- B. The atoms of the substances combine to form an element
- C. The atoms of the substances combine to form a mixture
- D. The atoms separate from each other
- E. Nothing happens

☐A: ☐B: ☐C: ☐D: ☐E:

**71** During the reaction that occurs in the above experiment which of the following takes place?

- A. Heat energy is taken in
- B. Heat energy is given out
- C. Chemical energy is taken in
- D. Chemical energy is given out
- E. Electrical energy is given out

☐A: ☐B: ☐C: ☐D: ☐E:

**72** In question 70, to get back copper and chlorine just

- A. add chemical energy
- B. take away chemical energy
- C. add electrical energy
- D. take away electrical energy
- E. add heat energy

☐A: ☐B: ☐C: ☐D: ☐E:

In the experiment illustrated here, a suitable current is passed through the solution.  
Now answer questions 73 - 78.

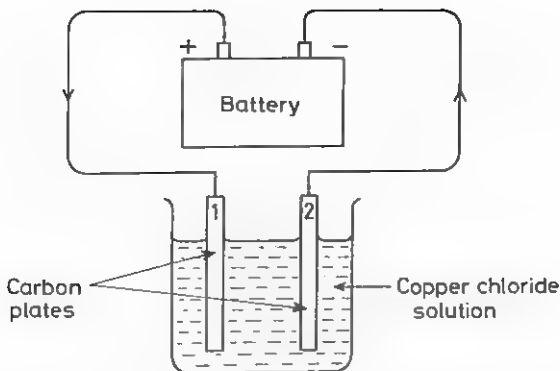


fig 36

**73** What is formed on the second carbon plate?

- A. carbon
- B. chlorine
- C. copper
- D. oxygen
- E. hydrogen

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**74** What is set free at the first carbon plate?

- A. hydrogen
- B. oxygen
- C. copper
- D. chlorine
- E. nothing

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**75** What happens to the copper chloride during the experiment?

- A. It is broken up into copper and chlorine
- B. It is broken up into copper oxide and chlorine
- C. It is broken up into oxygen and hydrogen
- D. It is separated into copper chloride solid and water
- E. Nothing happens to it at all because it just conducts electricity

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**76** What is the main liquid left in the beaker when the experiment is finally completed?

- A. liquid chlorine
- B. copper chloride solution
- C. copper sulphate solution
- D. hydrogen chloride solution
- E. water

☐A: ☐B: ☐C: ☐D: ☐E:

**77** Which one of the following statements is best illustrated by this experiment?

- A. Copper chloride is a compound
- B. Copper chloride can be broken up into its elements
- C. Copper chloride conducts electricity
- D. Copper chloride contains chlorine
- E. Copper chloride is a solution

☐A: ☐B: ☐C: ☐D: ☐E:

**78** What energy is being used up during the experiment?

- A. potential
- B. chemical
- C. heat
- D. electrical
- E. kinetic

☐A: ☐B: ☐C: ☐D: ☐E:

## Kinetic theory

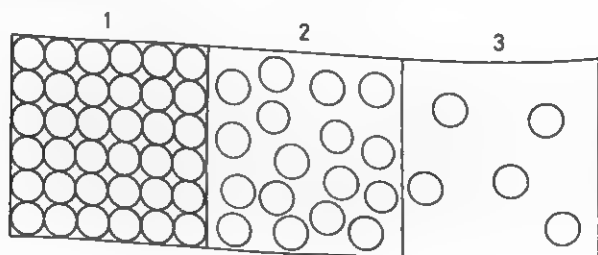


fig 37

The tray has three sections. Each section holds some marbles. The marbles represent molecules in matter.

When the tray is moved in a circular motion, the marbles in section 1 hardly move; the marbles in section 2 move about and collide with each other and hit against the walls of the tray; the marbles in section 3 move about very fast and very freely, colliding against the walls of the tray and sometimes with each other.

Now answer questions 79 - 82.

**79** Which section represents matter in a solid state?

- A. 1
- B. 2
- C. 3

~~A~~ ~~B~~ ~~C~~

**80** Which section represents matter in a gaseous state?

- A. 1
- B. 2
- C. 3

~~A~~ ~~B~~ ~~C~~

**81** Basing your ideas on this experiment, say which of these statements are true.

- I. The molecules in a gas all move in one direction at a time
- II. The molecules in a gas are free to move
- III. The molecules in a liquid are free to move
- IV. The molecules in a gas move very much faster than the molecules in a liquid

- A. I, II and III
- B. I and III
- C. II and IV
- D. IV only
- E. II, III and IV

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**82** Which of the following statements are illustrated by the experiment?

- I. Solids have a regular shape
- II. Solids do not have a regular shape
- III. There is more space in a gas than in a liquid
- IV. The molecules in a liquid cannot move about as fast as the molecules in a gas

- A. I and III
- B. I and IV
- C. II and III
- D. III and IV
- E. I, III and IV

☐ A: ☐ B: ☐ C: ☐ D: ☐ E:

**83** Which of these molecules move fastest?

- A. molecules in wood
- B. molecules in water
- C. molecules in oil
- D. molecules in carbon dioxide
- E. molecules in jelly

☐ A: ☐ B: ☐ C: ☐ D: ☐ E:

**84** Choose the correct statements.

- I. The molecules in a gas are very far apart
- II. The molecules in a gas can never collide with each other
- III. There is no space in between the molecules in a liquid
- IV. There is no space in between the molecules in a gel

- A. I, II and III
- B. I and III
- C. II and IV
- D. IV only
- E. I only

☐ A: ☐ B: ☐ C: ☐ D: ☐ E:



**85** Of the following statements only one is true.  
Choose the true statement.

- A. The molecules in a gas move about in one direction at a time
- B. The molecules in a gas move about at random
- C. The molecules in a gas do not move about
- D. The molecules in a gas move upwards only
- E. The molecules in a gas move downwards only

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**86** Select the correct statements.

- I. The molecules in alcohol are closer together than the molecules in air
- II. The molecules in alcohol collide with each other
- III. There is no space in between the molecules in alcohol
- IV. There is a little space in between the molecules in a gold leaf

- A. I and II
- B. II and III
- C. III and IV
- D. I, II and III
- E. I, II and IV

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**87** A block of iron has a regular shape because

- A. the molecules in it are very big
- B. the molecules in it are very heavy
- C. the molecules in it are very closely packed and held together
- D. the molecules are made of metal
- E. the molecules in iron have a different structure from those in liquids

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**88** Why does perfume smell?

- A. Perfume always gives out a smell
- B. Molecules from perfume travel outwards
- C. Molecules from perfume are vibrating
- D. Molecules from perfume are very tiny
- E. Molecules from perfume have energy

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**89** Which statement is correct?

- A. The molecules in iron are attracted to each other
- B. The molecules in iron do not attract each other
- C. The molecules in iron try to move away from each other
- D. The molecules in iron are lighter than those in wood
- E. The molecules in iron are heavier than those in gold

☐ A ☐ B ☐ C ☐ D ☐ E

**90** Why are gases more easily compressed than liquids?

- A. The molecules in gases are lighter than those in liquids
- B. The molecules in gases move about much faster than those in liquids
- C. The molecules in gases are much smaller than those in liquids
- D. The molecules in gases are much further apart than those in liquids
- E. The molecules in gases have more energy than those in liquids

☐ A ☐ B ☐ C ☐ D ☐ E

**91** Diffusion occurs more slowly in a liquid than in a gas.

Which reasons below will explain the above statement?

- I. The molecules in a liquid move slower than those in a gas
- II. The molecules in a liquid are heavier than those in a gas
- III. There is less space in a liquid than in a gas
- IV. A liquid is attracted by gravity

- A. I, II and III
- B. I and III
- C. II and IV
- D. IV only
- E. III only

☐ A ☐ B ☐ C ☐ D ☐ E

**92** The air which makes up the atmosphere consists mainly of oxygen and nitrogen. Since oxygen is slightly heavier than nitrogen two separate layers should form in the atmosphere. But this does not happen. How can this be explained?

- A. Winds mix the gases up
- B. Oxygen molecules and nitrogen molecules are attracted by each other
- C. Oxygen molecules and nitrogen molecules move about and mix with each other
- D. The earth is always turning
- E. Oxygen is always required by living things

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**93** The molecules in a solid are

- A. held tightly together and do not vibrate
- B. moving about, though through short distances only
- C. always changing their positions because of spaces between them
- D. always vibrating, but they do not change their positions
- E. sometimes vibrating

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

## Applications

**94** Gases rise through liquids. What does this show?

- A. Gas molecules move faster than liquid molecules
- B. Gas molecules are lighter than liquid molecules
- C. Gas molecules have more energy
- D. Gas molecules are not attracted by gravity
- E. Gas molecules always rise, and never sink

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

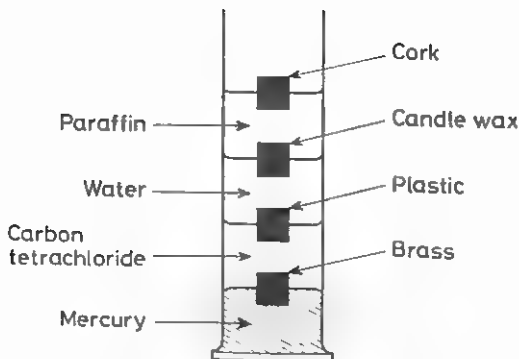


fig 38

Study the diagram, and then answer questions 95 - 98.

**95** Which statements about the above experiment are true?

- I. Brass is heavier than mercury
- II. Metals are heavier than non-metals
- III. Carbon tetrachloride is lighter than wax
- IV. Some solids are lighter than some liquids

- A. I, II and III
- B. I and III
- C. II and IV
- D. IV only
- E. none of these combinations

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**96** If all the solids are of the same size, which solid is made up of the heaviest molecules?

- A. cork
- B. wax
- C. plastic
- D. brass
- E. mercury

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**97** From the experiment it can be concluded that

- A. the molecules of some solids are lighter than the molecules of some liquids
- B. the molecules of solids are always lighter than the molecules in liquids
- C. all liquids do not mix
- D. all solids float in liquids
- E. no conclusion can be formed

☐A: ☐B: ☐C: ☐D: ☐E:

**98** The liquid which has molecules lighter than wax is

- A. cork
- B. paraffin
- C. water
- D. carbon tetrachloride
- E. mercury

☐A: ☐B: ☐C: ☐D: ☐E:

**99** Choose the correct statement.

- A. The molecules in solids are always heavier than the molecules in liquids
- B. The molecules in solids are always lighter than the molecules in liquids
- C. A liquid is sometimes made up of molecules which are heavier than those in a solid
- D. The molecules in some gases are heavier than the molecules in some liquids
- E. The molecules in some gases are even heavier than the molecules in some solids

☐A: ☐B: ☐C: ☐D: ☐E:

**100** When an iron ball is strongly heated, it expands. This is because the heat energy supplied makes the iron molecules

- A. change their shape
- B. change their size
- C. change their weight
- D. start to move away from each other
- E. vibrate very fast and push each other and occupy more space

☐A: ☐B: ☐C: ☐D: ☐E:

**101** Why does a metal bar expand when it is heated?

- A. The molecules in the metal bar increase their speed
- B. The molecules in the metal bar move away
- C. The molecules in the metal bar become bigger
- D. The molecules in the metal bar vibrate more violently and take up more room
- E. More molecules are formed

☐ A: ☐ B: ☐ C: ☐ D: ☐ E:

**102** When wax is heated it melts. This is because the heat energy supplied makes the wax molecules

- A. change their shape
- B. change their size
- C. change their weight
- D. vibrate
- E. vibrate so much that the molecules move away from their original positions

☐ A: ☐ B: ☐ C: ☐ D: ☐ E:

Study the diagrams. They refer to questions 103 - 105.

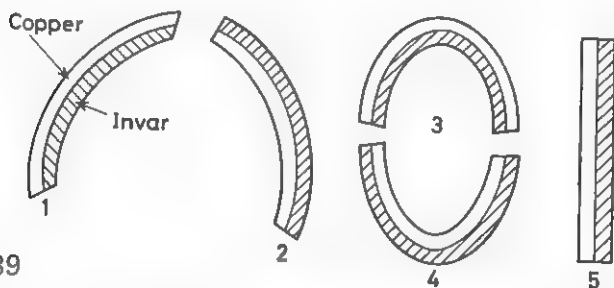


fig 39

**103** The bimetallic bar is heated. Which diagram shows what happens?

- A. 1
- B. 2
- C. 3
- D. 4
- E. 5

☐ A: ☐ B: ☐ C: ☐ D: ☐ E:

**104** Why does the bimetallic bar behave in that manner?

- A. The invar molecules vibrate more than the copper molecules
- B. The copper molecules vibrate more than the invar molecules
- C. The invar molecules increase their speed more than the copper molecules
- D. The copper molecules increase their speed more than the invar molecules
- E. The invar and the copper molecules receive the same amount of heat energy and therefore the bar remains straight

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**105** Which instruments sometimes make use of the principle illustrated by this experiment?

- I. automatic fire alarm
- II. thermostat
- III. bimetallic thermometer
- IV. Aneroid barometer

- A. I, II and III
- B. I and III
- C. II and IV
- D. III only
- E. IV only

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**106** Why does a liquid expand when it is heated?

- A. The molecules become bigger
- B. The number of molecules becomes more
- C. The molecules break up into smaller particles which occupy more space
- D. The molecules become heavier and therefore expand
- E. The molecules receive more energy, increase their speed, and move further apart from each other

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

107 When water is boiled, steam is formed. The steam consists of

- A. molecules which have changed their shape
- B. molecules which have become smaller
- C. molecules which have become lighter
- D. molecules which have less atoms
- E. molecules moving away

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

108 Gas pressure is due to

- A. molecules moving about
- B. molecules vibrating
- C. molecules hitting against the walls of the container
- D. molecules colliding with each other
- E. too many molecules in the container

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

109 The pressure of a gas increases when the gas is heated because

- A. the gas molecules increase in size
- B. the gas molecules increase in weight
- C. the gas molecules get extra energy and vibrate faster
- D. the gas molecules get extra energy and increase their speed
- E. the gas molecules stick to the walls of the container

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

110 What does an Aneroid barometer measure?

- A. temperature
- B. weight
- C. force of gravity
- D. atmospheric pressure
- E. gas pressure

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~



**111** What does a Bourdon gauge measure?

- A. temperature
- B. volume
- C. length
- D. atmospheric pressure
- E. gas pressure

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**112** What is a thermostat used for?

- A. It keeps a place or an instrument at the same temperature
- B. It measures the pressure of the laboratory gas
- C. It measures the pressure of the air
- D. It measures the temperature of the atmosphere
- E. It gives out an alarm

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**113** Which instrument has a box that has a partial vacuum in it?

- A. Bourdon gauge
- B. Aneroid barometer
- C. thermostat
- D. automatic fire alarm
- E. syringe

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**114** Which instrument has a metal tube that tries to straighten when a gas is passed into it?

- A. automatic fire alarm
- B. Aneroid barometer
- C. Bourdon gauge
- D. thermostat
- E. Magdeburg hemisphere

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

Questions 115 - 118 are four numbered statements. They are preceded by five lettered diagrams. For each numbered statement, select the diagram which is most clearly related to it.

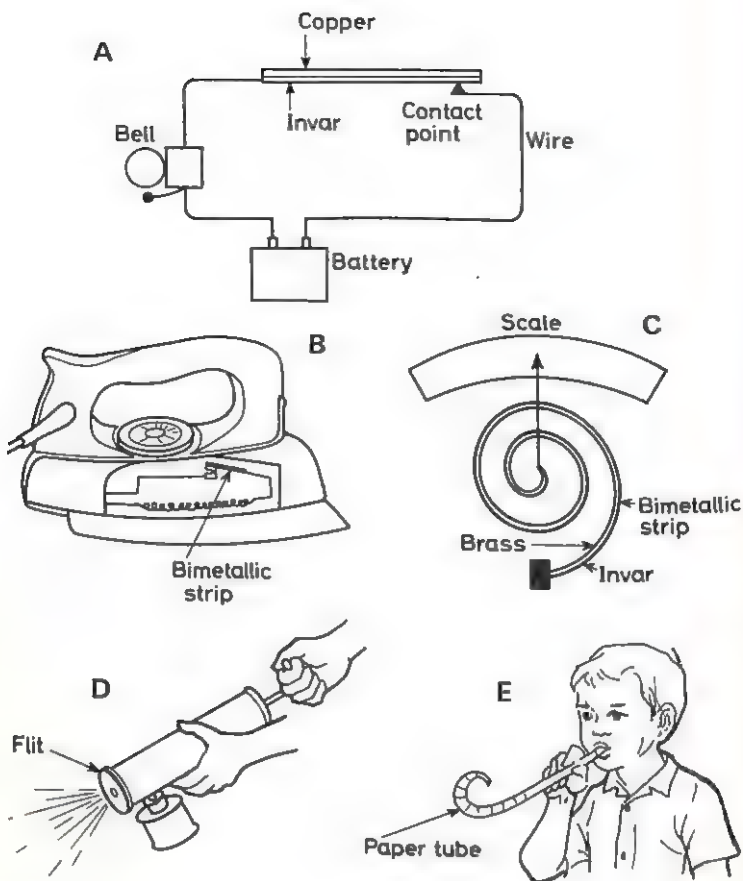


fig 40

**115** The diagram shows the principle of a thermostat

☐ A ☐ B ☐ C ☐ D ☐ E

**116** The diagram shows the principle of an automatic fire alarm

☐ A ☐ B ☐ C ☐ D ☐ E

**117** The diagram shows the principle of a bimetallic thermometer

☐ A ☐ B ☐ C ☐ D ☐ E

**118** The diagram shows the principle of a Bourdon gauge

☐ A ☐ B ☐ C ☐ D ☐ E

# 5 Cells and reproduction

## Cells and living things

1 The cell is

- A. the unit on which life depends
- B. the unit for weight
- C. the unit for volume
- D. the unit for temperature
- E. any box-like structure

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

2 The diagram shows a piece of skin from an onion seen under a microscope.

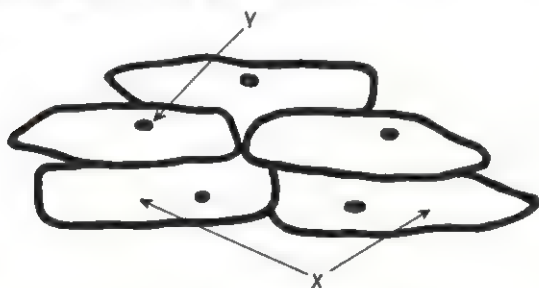


fig 41

a. Each structure marked X is called

- A. a cell wall
- B. a cork
- C. a nucleus
- D. a box
- E. a cell

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

b. Structure Y is

- A. a starch grain
- B. a cork
- C. a food particle
- D. a nucleus
- E. a cell

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- 3 The diagram shows a portion of the skin of a spider lily leaf under a microscope.

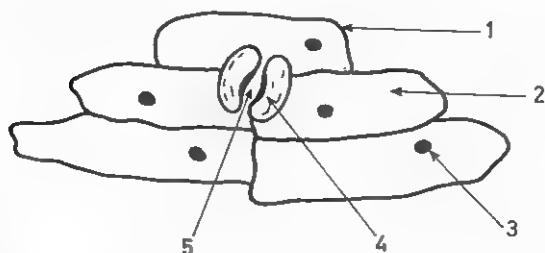


fig 42

- a. Which numbered part allows water and air to pass through?

A. 1  
B. 2  
C. 3  
D. 4  
E. 5

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- b. Which part shows the nucleus of a cell?

A. 1  
B. 2  
C. 3  
D. 4  
E. 5

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- c. The parts which can close or open a pore for water and air to pass through are called

A. nuclei  
B. guard-cells  
C. starch grains  
D. cells  
E. stomata

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- 4 Stomata are important to a plant because

A. each stoma has two guard-cells  
B. they allow water and air to pass through them  
C. they allow only oxygen to pass through them

- D. they allow only water to pass through them
- E. they allow only carbon dioxide to pass through them

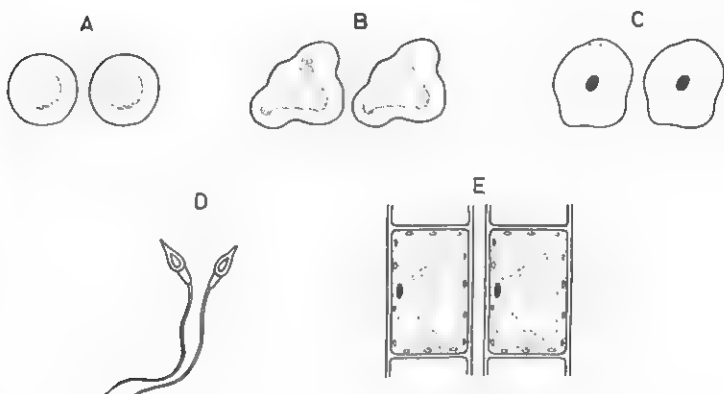
~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

5 The structure which controls most of the activities in a living cell is

- A. starch
- B. water
- C. the nucleus
- D. the cell wall
- E. the cell space

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

6 Which diagram shows the cheek cells?



~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

fig 43

7 Which of these statements are correct?

- I. Animal cells may live in water
- II. Animal cells do not have nuclei
- III. Plant cells have nuclei
- IV. Plant cells have cell walls

- A. I, II and III
- B. I and III
- C. II and IV
- D. IV only
- E. I, III and IV

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

8 Choose the statement which is incorrect.

- A. Most living cells have a nucleus
- B. Living things are made up of cells
- C. A plant cell has a dead cell wall
- D. An animal cell has a dead cell membrane
- E. There are some animals which have only one cell

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

## Cells in reproduction and reproductive structures in plants and animals



fig 44

9 What does the diagram illustrate?

- A. a sperm
- B. an egg cell
- C. a plant cell
- D. a cheek cell
- E. a skin cell

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

10 Which one of the following is able to move by itself?

- A. an egg cell
- B. a sperm
- C. a cheek cell
- D. an onion cell
- E. a muscle cell

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

11 Which one of the following is a reproductive cell that does not move by itself?

- A. an egg cell
- B. a sperm
- C. a cheek cell
- D. an onion cell
- E. a muscle cell

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

12 In flowers, the male reproductive cells are contained in the

- A. anthers
- B. stigmas
- C. pollen grains
- D. ovules
- E. ovaries

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

13 In flowers, the female reproductive cells are contained in the

- A. anthers
- B. stigmas
- C. pollen grains
- D. ovules
- E. ovaries

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

14 What is the main function of a flower?

- A. to attract insects
- B. to make pollen grains
- C. to produce a sweet smell
- D. to produce a sweet sap
- E. to reproduce the plant

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

15 The diagram shows a longitudinal section of a flower.

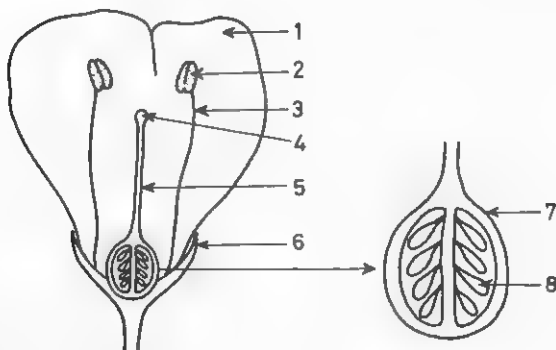


fig 45

a. Pollen grains are produced in

- A. 1
- B. 2
- C. 3
- D. 4
- E. 5

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

b. Pollen grains fall and grow on

- A. 1
- B. 2
- C. 3
- D. 4
- E. 5

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

c. When a pollen grain grows its pollen tube, the tube will move down

- A. 2
- B. 3
- C. 4
- D. 5
- E. 6

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

d. Seeds are developed from the part numbered

- A. 2
- B. 4
- C. 6
- D. 7
- E. 8

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

e. The part which will develop into a fruit is

- A. 2
- B. 4
- C. 6
- D. 7
- E. 8

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~



**16** The diagrams show the parts of a plant.

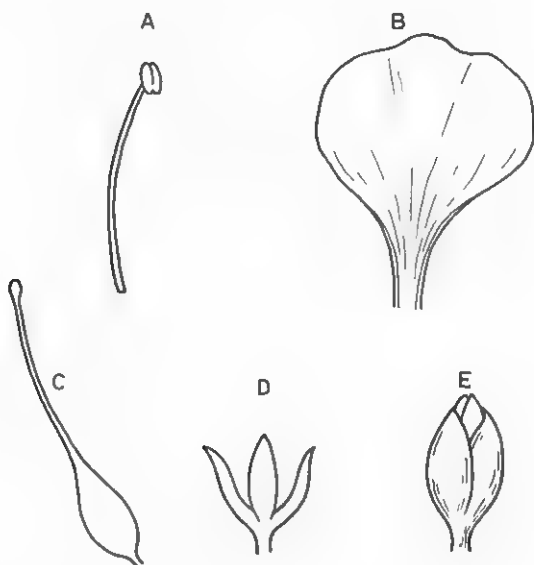


fig 46

- Which diagram represents the male part of a flower?  
☐ A ☐ B ☐ C ☐ D ☐ E
- Which diagram represents the female part of a flower?  
☐ A ☐ B ☐ C ☐ D ☐ E
- Which diagram has the structure that can develop into a fruit?  
☐ A ☐ B ☐ C ☐ D ☐ E
- Which diagram has the structure that makes male reproductive cells?  
☐ A ☐ B ☐ C ☐ D ☐ E
- Which diagram has the structure that holds female reproductive cells?  
☐ A ☐ B ☐ C ☐ D ☐ E
- Which part of a flower attracts insects?  
☐ A ☐ B ☐ C ☐ D ☐ E

**17** Where are pollen grains made in the flower?

- A. in the petals
- B. in the anthers
- C. in the ovary
- D. in the ovules
- E. in the stigma

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**18** Name the structure which can develop into a fruit.

- A. anther
- B. stigma
- C. ovule
- D. flower stalk
- E. ovary

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**19** Name the structures which can develop into seeds.

- A. pollen grains
- B. ovules
- C. ovaries
- D. anthers
- E. stigmas

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**20** Which statements are correct?

- I. The anthers make pollen grains
- II. The stigma receives pollen grains
- III. The ovary makes ovules
- IV. The ovary becomes the seed

- A. I, II and III
- B. I and III
- C. II and III
- D. II and IV
- E. IV only

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- 21 The diagram shows the female urinary and genital organs of a rabbit.

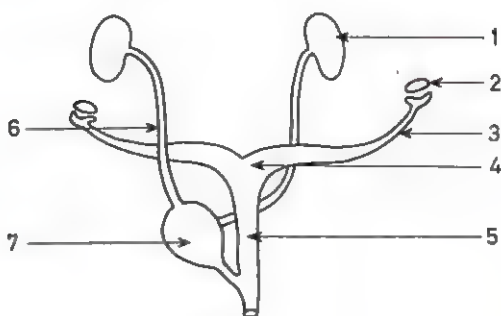


fig 47

- a. Which numbered part indicates an ovary?

- A. 1  
B. 2  
C. 4  
D. 5  
E. 7

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- b. Which numbered part indicates the uterus?

- A. 1  
B. 2  
C. 3  
D. 4  
E. 6

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- c. Which numbered part indicates an oviduct?

- A. 3  
B. 4  
C. 5  
D. 6  
E. 7

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- d. In which numbered part are reproductive eggs formed?

- A. 1
- B. 2
- C. 4
- D. 5
- E. 7

☐A: ☐B: ☐C: ☐D: ☐E:

e. In which part is a growing embryo normally kept?

- A. 1
- B. 3
- C. 4
- D. 5
- E. 7

☐A: ☐B: ☐C: ☐D: ☐E:

**22** Which part makes sperms?

- A. ovary
- B. oviduct
- C. uterus
- D. sperm duct
- E. testis

☐A: ☐B: ☐C: ☐D: ☐E:

**23** Select the statement which is false.

- A. Sperms are male reproductive cells
- B. Testes make sperms
- C. Sperms travel down oviducts
- D. A mammalian sperm has a tail
- E. A sperm has a nucleus

☐A: ☐B: ☐C: ☐D: ☐E:

## Pollination and fertilisation

**24** Before a fruit can be formed, pollen grains must fall on which part of a flower?

- A. stigma
- B. anther
- C. petal
- D. ovary
- E. ovule

☐A: ☐B: ☐C: ☐D: ☐E:

**25** Pollination has taken place in a flower when

- A. the pollen grains are ripe
- B. a pollen grain grows a pollen tube
- C. insects visit a flower
- D. the male cells and the female cells fuse
- E. pollen grains fall on the stigma

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**26** The transfer of pollen grains from an anther to the stigma of the same flower is known as

- A. dispersal
- B. self-fertilisation
- C. cross-fertilisation
- D. self-pollination
- E. cross-pollination

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**27** A plant prefers pollen grains from another plant to fall on its stigmas. Why?

- A. This gives more beautiful flowers
- B. This gives more colourful flowers
- C. This gives bigger flowers
- D. This produces better seeds
- E. This produces better fruits

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**28** Choose the true statements.

- I. Plants ensure cross-pollination by having separate male and female flowers
- II. Plants ensure cross-pollination by having the stigmas and the stamens ripen at different times
- III. Plants ensure cross-pollination by having white flowers
- IV. Plants ensure cross-pollination by having small pollen grains

- A. I and II
- B. II and III
- C. III and IV
- D. I and III
- E. I only

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**29** Which of the following items help a plant to carry its pollen grains to another flower?

- I. wind
- II. insects
- III. snails
- IV. water

- A. I, II and III
- B. I and III
- C. II and IV
- D. I, II and IV
- E. I only

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**30** Insects are usually attracted to a flower because of

- I. its colourful petals
- II. its pleasant smell
- III. its sap
- IV. its softness

- A. I, II and III
- B. I and III
- C. II and IV
- E. IV only
- E. none of these combinations

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**31** Insects usually visit flowers to

- A. eat the soft petals
- B. collect the pollen grains
- C. drink the sweet sap
- D. help in fertilisation
- E. help the fruit to develop

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**32** Which of the following may be found in a pollen tube?

- A. one nucleus
- B. two nuclei
- C. one cell

- D. two cells
- E. one egg

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

### 33 What is fertilisation?

- A. Fertilisation takes place when a male cell fuses with a female cell
- B. Fertilisation takes place when pollen grains fall onto the stigma of a flower
- C. Fertilisation takes place when a pollen grain grows a pollen tube
- D. Fertilisation takes place when an ovary begins to develop into a fruit
- E. Fertilisation takes place when the ovules become ripe

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

### 34 After successful fertilisation, what happens to the ovules?

- A. They separate from the ovary wall
- B. They can absorb oxygen
- C. They can absorb water
- D. They wither and die
- E. They develop into seeds

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

### 35 After successful fertilisation, what happens to the ovary?

- A. It dies gradually
- B. It absorbs more oxygen
- C. It absorbs water and enlarges
- D. It develops into a fruit
- E. It shrinks and dries up

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

## Structure of a bean seed and germination

### 36 What is the use of the seed hole in a seed?

- A. It serves as an opening for the seed root to come out

- B. It allows sunlight to get to the embryo
- C. It allows water and air to pass through
- D. It allows water only to pass through
- E. It allows air only to pass through

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**37** The diagram shows a sword-bean seed split open.

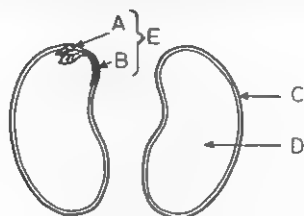


fig 48

a. Which lettered part is the seed root or radicle?

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

b. Which lettered part is the seed shoot or plumule?

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

c. The embryo is the portion lettered . . . . .

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

d. Which lettered part protects the seed?

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

e. Which lettered part stores food for the seed-ling later on?

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**38** a. A bean seed is split open and iodine solution is dropped onto the seed.  
What do you see?

- A. The seed shoot turns black
- B. The seed root turns black
- C. The seed leaves or cotyledons turn black
- D. The seed coat turns yellow
- E. A gas is set free from the seed

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

b. What causes the reaction in the bean seed?

- A. starch in the seed shoot
- B. starch in the seed root



- C. starch in the seed leaves
- D. the iodine stains the seed coat
- E. the particles in the bean seed

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**39** Which part of a seed will grow into the root system?

- A. radicle or seed root
- B. plumule or seed shoot
- C. embryo or baby plant
- D. cotyledon or seed leaf
- E. seed coat

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**40** Which part of a seed will grow into branches and leaves?

- A. radicle
- B. plumule
- C. embryo
- D. cotyledon
- E. seed coat

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**41** When a seed germinates, the first part to grow out is the

- A. stem
- B. green leaf
- C. seed leaf
- D. seed root
- E. seed shoot

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**42** Through which part of a seed does the seed root grow out?

- A. seed scar
- B. seed hole
- C. seed coat on the side opposite the seed scar
- D. seed coat above the seed hole
- E. seed coat below the seed hole

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

- 43 Why does the seedling stem bend itself when it is growing out of the soil?

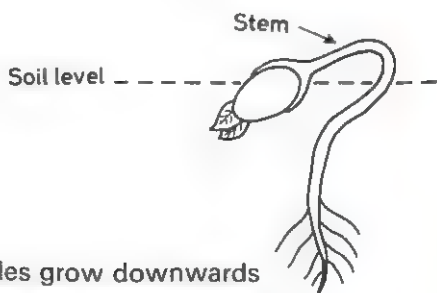


fig 49

- A. because the plumules grow downwards
- B. because the plumules are heavy
- C. because the cotyledons are heavy
- D. because the stem is too long
- E. because in this way the plumule will not get damaged

☐ A ☐ B ☐ C ☐ D ☐ E

- 44 a. When cotyledons are made to grow out above the soil they turn

- A. green
- B. yellow
- C. white
- D. brown
- E. black

☐ A ☐ B ☐ C ☐ D ☐ E

- b. What substance causes this colour?

- A. leaf green or chlorophyll
- B. starch
- C. iodine
- D. sugar
- E. air

☐ A ☐ B ☐ C ☐ D ☐ E

- c. How does this substance help a plant?

- A. It helps a plant to get oxygen
- B. It helps a plant to get water
- C. It helps a plant to grow tall
- D. It helps a plant to make starch
- E. It helps a plant to make iodine

☐ A ☐ B ☐ C ☐ D ☐ E

d. What advantage is there for the cotyledons to have this substance?

- A. With this substance the cotyledons help the plant to get oxygen
- B. With this substance the cotyledons help the plant to get water
- C. With this substance the cotyledons help the plant to make starch
- D. With this substance the cotyledons help the plant to make iodine
- E. There is no advantage for the cotyledons to have this substance

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

45 As a seedling grows, the cotyledons shrink and become smaller. Why does this happen?

- A. The cotyledons must wither and drop off because they are useless to the seedling
- B. The cotyledons lose their water
- C. The cotyledons become old
- D. The cotyledons cannot stand sunlight
- E. The food in the cotyledons is used by the seedling

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

46 The diagram shows a seedling.

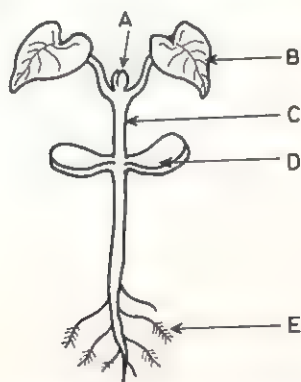


fig 50

a. Which letter indicates a first green leaf?

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

b. Which letter indicates a cotyledon?

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

c. Which letter indicates a root hair?

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

d. What is the use of root hairs?

- A. to make food for the plant
- B. to make starch
- C. to pull the big roots through the soil
- D. to absorb water
- E. to protect the big roots

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

## Dispersal of seeds and fruits

47 Which of these items help a plant to disperse its seeds and fruits?

- I. wind
- II. water
- III. animals

- A. I only
- B. II only
- C. III only
- D. I and III
- E. I, II and III

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

48 Why should a plant try to disperse its seeds and fruits?

- A. to hide them from animals
- B. to avoid over crowding
- C. to take up more water
- D. to get more air
- E. to protect them

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

49 The rubber tree disperses its seeds by having fruits which

- A. burst open when ripe
- B. dry up very fast

- C. ripen very fast
- D. do not ripen at all
- E. do not split open

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**50** How does an orchid plant disperse its seeds?

- A. Insects help disperse the seeds
- B. Birds help disperse the seeds
- C. Water helps disperse the seeds
- D. Wind helps disperse the seeds
- E. By having explosive fruits

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**51** The coconut fruit is very suitable for dispersal by water because

- A. it has a hard shell inside
- B. it floats on water and does not rot in water
- C. it stores up food
- D. it stores up water
- E. it is very big

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**52** Which plant has small seeds that can pass through an animal's food canal without being digested?

- A. orchid
- B. castor oil
- C. brinjal
- D. rambutan
- E. bean

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

Questions 53 - 57 shown consist of five lettered agents for dispersal, followed by five numbered diagrams. For each numbered diagram, select the agent which is most suitable to disperse the seed or fruit. Each agent for dispersal may be used once, more than once, or not at all.

*Agents*

- A. Wind
- B. Water
- C. Animals
- D. Insects
- E. Explosive fruits

53

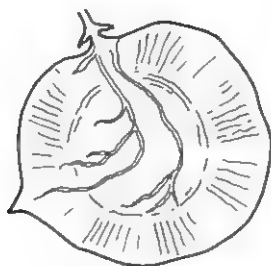


fig 51

☐A: ☐B: ☐C: ☐D: ☐E:

54



fig 52

☐A: ☐B: ☐C: ☐D: ☐E:

55

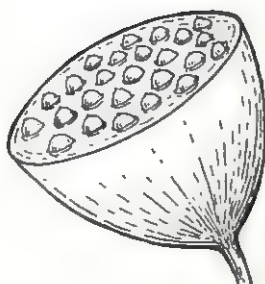


fig 53

☐A: ☐B: ☐C: ☐D: ☐E:

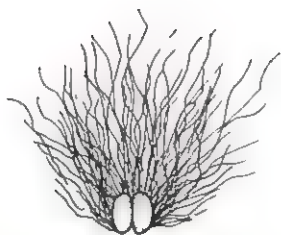


fig 54

☐ A ☐ B ☐ C ☐ D ☐ E

57

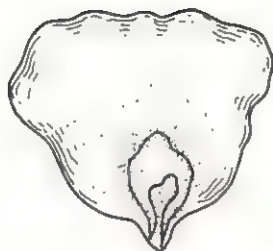


fig 55

☐ A ☐ B ☐ C ☐ D ☐ E

58 How is the mango fruit usually dispersed?

- A. by wind
- B. by insects
- C. by water
- D. by man
- E. by an explosive mechanism

☐ A ☐ B ☐ C ☐ D ☐ E

59 Juicy fruits are very suitable for dispersal by

- A. wind
- B. insects
- C. water
- D. an explosive mechanism
- E. animals

☐ A ☐ B ☐ C ☐ D ☐ E

## The growing chick embryo

- 60 The diagram shows the longitudinal section of a fertilised hen's egg.

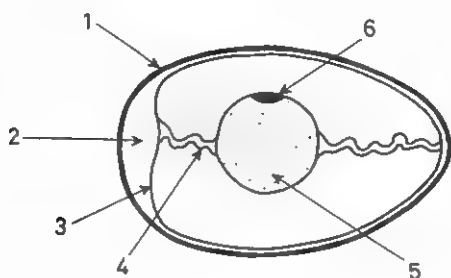


fig 56

- a. The yolk is the part indicated by the number

A. 3  
B. 4  
C. 5  
D. 6  
E. 7

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- b. The part which is made of chalk is numbered

A. 1  
B. 2  
C. 3  
D. 4  
E. 5

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- c. The part which holds the yolk in position is numbered

A. 2  
B. 3  
C. 4  
D. 5  
E. 6

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~



d. The structure which will develop into a chick is represented by the number

- A. 3
- B. 4
- C. 5
- D. 6
- E. 7

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

e. What is the use of the air space?

- A. to prevent the egg from rolling over
- B. to prevent the egg from becoming bad
- C. to allow space for more albumen to form
- D. to allow space for the chick to grow
- E. to supply oxygen to the growing embryo

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

f. What is the use of the yolk?

- A. to serve as a place for the chick to attach itself
- B. to supply food to the growing embryo
- C. to help the embryo to float in the egg
- D. to protect the embryo
- E. to support the embryo

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

61 A fertilised egg cell of a hen grows larger because

- A. the fertilised cell absorbs water
- B. the fertilised cell absorbs oxygen
- C. the nucleus in the fertilised cell divides
- D. the fertilised cell multiplies into more cells
- E. the fertilised cell joins up with other cells

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

62 An egg will not develop into an embryo unless it is

- A. fertilised
- B. ripe
- C. old
- D. big
- E. warm

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**63** What does a fertilised egg cell require in order to hatch into a chick?

- I. correct temperature
- II. correct moisture
- III. supply of oxygen
- IV. supply of food from the yolk

- A. I, II and III
- B. I and III
- C. II and IV
- D. I only
- E. I, II, III and IV

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**64** The diagram shows a developing chick.

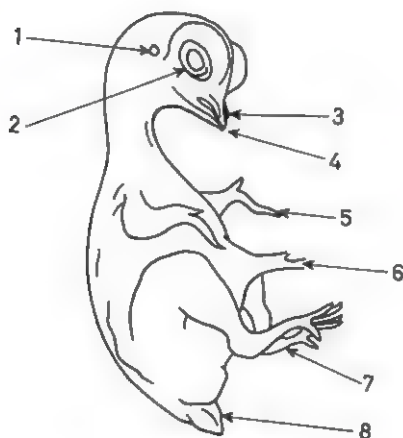


fig 57

a. Which numbered part shows an ear hole?

- A. 1
- B. 2
- C. 3
- D. 4
- E. 5

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

b. Which numbered part shows an eye?

- A. 1
- B. 2
- C. 3
- D. 4
- E. 5

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

c. Which numbered part is the egg tooth?

- A. 1
- B. 3
- C. 4
- D. 5
- E. 6

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

d. Which numbered part will develop into a wing?

- A. 4
- B. 5
- C. 6
- D. 7
- E. 8

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

e. Which numbered part will develop into a leg?

- A. 4
- B. 5
- C. 6
- D. 7
- E. 8

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

f. The numbered part which is connected to the egg yolk is

- A. 4
- B. 5
- C. 6
- D. 7
- E. 8

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

g. Why is this part attached to the yolk?

- A. to get food
- B. to get a place for attachment
- C. to get protection
- D. to get blood
- E. to get water

☐A: ☐B: ☐C: ☐D: ☐E:

## Reproduction in man

65 The diagram shows the urinary and genital organs of a human male.

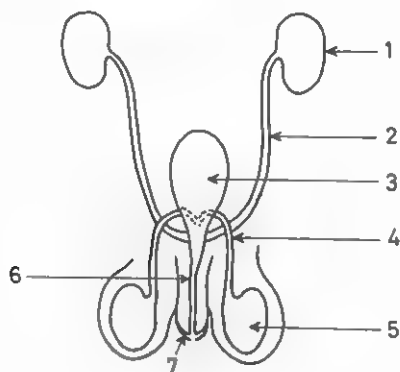


fig 58

a. Which numbered part shows a testis?

- A. 1
- B. 2
- C. 3
- D. 4
- E. 5

☐A: ☐B: ☐C: ☐D: ☐E:

b. Which numbered part is called the sperm duct?

- A. 2
- B. 3
- C. 4
- D. 5
- E. 6

☐A: ☐B: ☐C: ☐D: ☐E:

c. The urethra is the part numbered

- A. 2
- B. 3
- C. 4
- D. 6
- E. 7

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

d. Which numbered part represents the penis?

- A. 3
- B. 4
- C. 5
- D. 6
- E. 7

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**66** Which part of a man's body makes sperms?

- A. testis
- B. sperm ducts
- C. scrotal sac
- D. urethra
- E. penis

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**67** What is the use of a sperm duct?

- A. to carry sperms from the penis
- B. to carry sperms from a testis
- C. to make sperms
- D. to store sperms
- E. to keep an embryo

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**68** Which part connects a testis to the urethra?

- A. penis
- B. oviduct
- C. sperm duct
- D. uterus
- E. womb

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

69    Sperms pass out of a man's body through a duct called the

- A. sperm duct
- B. penis
- C. oviduct
- D. urethra
- E. vagina

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

70    The diagram shows the urinary and genital organs of a human female.

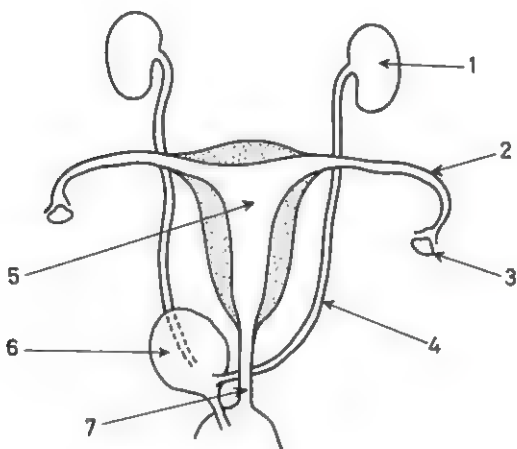


fig 59

a.    Which numbered part is called an ovary?

- A. 1
- B. 2
- C. 3
- D. 4
- E. 5

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

b. Which numbered part represents an oviduct?

- A. 2
- B. 3
- C. 4
- D. 5
- E. 6

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

c. Which numbered part is the uterus?

- A. 1
- B. 3
- C. 5
- D. 6
- E. 7

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

d. Which numbered part is the vagina?

- A. 3
- B. 4
- C. 5
- D. 6
- E. 7

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

71 Which part of a woman's body makes reproductive eggs or ova?

- A. vagina
- B. uterus
- C. oviduct
- D. bladder
- E. ovary

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

72 Reproductive eggs pass from an ovary down

- A. an oviduct
- B. a sperm duct
- C. the uterus
- D. the womb
- E. the vagina

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**73** During the sexual act between a male and female, where are the sperms placed?

- A. ovary
- B. oviduct
- C. uterus
- D. vagina
- E. bladder

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**74** What forms after a sperm has fertilised an egg cell?

- A. a more active sperm
- B. a bigger egg cell
- C. two cells
- D. an embryo
- E. a baby

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**75** Which part of the female body keeps and protects the embryo?

- A. ovary
- B. oviduct
- C. vagina
- D. testis
- E. uterus

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**76** The diagram shows a human embryo.

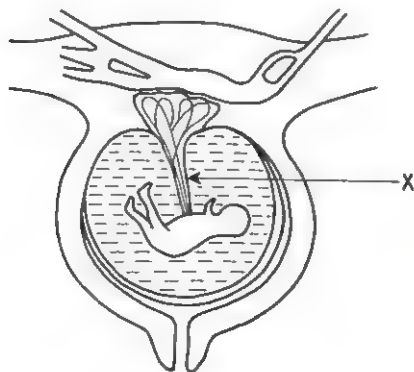


fig 60



What is the name of the structure labelled X?

- A. placenta
- B. umbilical cord
- C. water bag
- D. navel
- E. uterus

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**77** What are the functions of the placenta?

- I. It supplies the embryo with food and oxygen from the mother
- II. It carries waste products from the embryo
- III. It fixes the embryo to the mother
- IV. It supplies the embryo with blood from the mother

- A. I, II and III
- B. I and III
- C. II and IV
- D. III and IV
- E. IV only

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**78** Which of the females of these animals have the placenta?

- A. fish
- B. amphibians
- C. reptiles
- D. birds
- E. mammals

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**79** In what way does the fluid bag help the embryo?

- A. It allows oxygen to diffuse to the embryo
- B. It gives the embryo a pond to swim in
- C. It supplies the embryo with water
- D. It supplies the embryo with food
- E. It protects the embryo against shocks and knocks

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**80** What is the function of the uterus?

- A. It makes sperms
- B. It makes reproductive eggs
- C. It holds sperms until they are used
- D. It holds the fertilised egg and protects it
- E. It protects the ovaries

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**81** How does the embryo in the uterus feed?

- A. It feeds on yolk
- B. It feeds on the fluid in the water bag
- C. It feeds on oxygen only
- D. It sucks food from the uterus wall
- E. It sucks food from the ovaries

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**82** The eggs of mammals do not have yolk, and so the embryos of mammals

- A. take a few months to develop
- B. have to take food from their mother's uterus wall
- C. cannot be fertilised outside the body
- D. cannot be developed in the oviduct
- E. cannot move about on their own

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**83** Which statement about the human being is correct?

- A. The ovary is the female reproductive egg
- B. The ovary produces ovules
- C. The ovary produces reproductive egg cells
- D. The ovary protects the embryo
- E. The ovary is another name for the uterus

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**84** Which of these are true?

- I. In the mammal the oviduct opens into the uterus
- II. In the mammal the oviduct never carries eggs
- III. The oviduct of a mammal carries reproductive eggs

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

IV. The uterus is another name for the womb of a mammal

- A. I, II and III
- B. I and III
- C. II and IV
- D. IV only
- E. none of these combinations

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**85** What is the gestation period for a human embryo?

- A. about 3 months
- B. about 6 months
- C. about 9 months
- D. about 12 months
- E. about 15 months

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**86** How often does a menstrual cycle occur in a woman?

- A. about once a week
- B. about once a month
- C. about once in two months
- D. about once in six months
- E. about once a year

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**87** Which type of fertilisation given below will result in identical twins?

- A. One sperm fertilises one egg cell
- B. One fertilised egg cell divides into two
- C. Two separate fertilised egg cells develop in the uterus
- D. Two sperms fertilise one egg cell
- E. One sperm fertilises two egg cells

~~::A::~~ ~~::B::~~ ~~::C::~~ ~~::D::~~ ~~::E::~~

**88** Which of these animals care for their young?

- I. goldfish
- II. toads
- III. lizards

- IV. swallows
- V. cats

- A. I and II
- B. II and III
- C. III and IV
- D. IV and V
- E. none of these combinations

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**89** Which of these animals give milk to their young?

- A. rabbits
- B. ducks
- C. snakes
- D. frogs
- E. fish

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

## 6 Electricity

### Electricity at rest

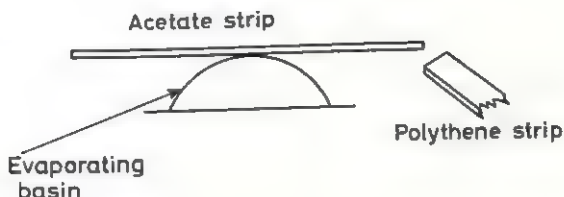


fig 61

1 An acetate strip is vigorously rubbed with a piece of silk cloth. It is then placed on an evaporating basin as shown in the diagram, so that the strip is free to turn. A polythene strip is also vigorously rubbed with a piece of silk cloth, and is brought near one end of the acetate strip.

a. What happens?

- A. The two strips attract each other
- B. The two strips repel each other
- C. One end of the acetate strip is attracted to, and one end is repelled by, the polythene strip
- D. The two strips give out sparks
- E. The acetate strip remains still

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

b. Which statement below explains the behaviour of the two strips?

- A. The two strips are positively charged with electricity
- B. The two strips are negatively charged with electricity

- C. One strip is positively charged, and one strip is negatively charged, with electricity
- D. The acetate strip is magnetised
- E. The polythene strip is magnetised

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

- c. If the experiment described above was repeated, using two strips of the same substance, which one of the following observations would take place?

- A. The two strips attract each other
- B. The two strips repel each other
- C. One end of the strip resting on the basin is attracted, and the other end is repelled
- D. The two strips give out a few sparks
- E. Nothing happens

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

- 2 When a plastic comb is vigorously rubbed with a piece of yellow cloth, it can attract tiny pieces of dry paper. The comb can do this because

- A. it is charged with more atoms
- B. it is charged with more molecules
- C. it is charged with magnetism
- D. it is charged with electricity at rest or static electricity
- E. it is charged with electricity in motion or current electricity

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

- 3 When two strips of material having the same kind of electric charge (both positive, or both negative) are brought close together

- A. they will not move
- B. they have a pair of ends that repel each other and a pair of ends that attract each other
- C. they give out sparks
- D. they attract each other
- E. they repel each other

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

4 When two strips of material having different electric charges are brought close together

- A. they attract each other
- B. they repel each other
- C. they have a pair of ends that attract each other and a pair of ends that repel each other
- D. they give out sparks
- E. they will not move or give out sparks

~~..A:~~ ~~..B:~~ ~~..C:~~ ~~..D:~~ ~~..E:~~

## What is electricity?

5 Which of these statements are true?

- I. Scientists have discovered static electricity
- II. Scientists have discovered current electricity
- III. There are two kinds of electric charges only — positive and negative
- IV. Electricity is not energy

- A. I, II and III
- B. I and III
- C. II and IV
- D. I and II
- E. III only

~~..A:~~ ~~..B:~~ ~~..C:~~ ~~..D:~~ ~~..E:~~

6 Choose the statements which are correct.

- I. Current electricity flows along a conductor
- II. Static electricity does not flow along a conductor
- III. Current electricity can be changed into static electricity
- IV. Both types of electricity are different forms of energy

- A. I, II and III
- B. I and III
- C. II and IV
- D. I only
- E. none of these combinations

~~..A:~~ ~~..B:~~ ~~..C:~~ ~~..D:~~ ~~..E:~~

**7** Each particle in matter has positive (+) and negative (-) charges. The negative charges are called

- A. atoms
- B. molecules
- C. electrons
- D. protons
- E. amperes

☐A ☐B ☐C ☐D ☐E

**8** When two different materials are rubbed together ..... may be added or removed from the particles which make up the materials.

- A. amperes
- B. atoms
- C. molecules
- D. electrons
- E. protons

☐A ☐B ☐C ☐D ☐E

**9** An electric current is a stream of ..... flowing in a conductor.

- A. protons
- B. electrons
- C. atoms
- D. molecules
- E. amperes

☐A ☐B ☐C ☐D ☐E

**10** Choose the statements which are true.

- I. Electrons are positive charges
- II. When electrons are added to a substance, it becomes negatively charged
- III. When electrons are removed from a substance, it becomes positively charged
- IV. Positive charges and negative charges repel each other

- A. I, II and III
- B. I and III
- C. II and IV
- D. II and III
- E. I and IV

☐A ☐B ☐C ☐D ☐E



## Electricity in motion

11 Electricity in motion is

- A. static electricity
- B. current electricity
- C. electric force
- D. electric pressure
- E. electric resistance

☐ A ☐ B ☐ C ☐ D ☐ E

12 A substance which allows electricity to flow through it easily is called

- A. a resistance
- B. an insulator
- C. a conductor
- D. a regulator
- E. an element

☐ A ☐ B ☐ C ☐ D ☐ E

13 A substance which does not allow electricity to flow through it is called

- A. a resistance
- B. a conductor
- C. a regulator
- D. an insulator
- E. an element

☐ A ☐ B ☐ C ☐ D ☐ E

14 Which of these materials are insulators?

- I. rubber
- II. carbon
- III. porcelain
- IV. iron

- A. I, II and III
- B. II and IV
- C. I and III
- D. I only
- E. IV only

☐ A ☐ B ☐ C ☐ D ☐ E

**15** Which of these materials conduct electricity easily?

- A. plastic
- B. wood
- C. leather
- D. glass
- E. lead

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**16** What does an ammeter measure?

- A. electric current
- B. electric force
- C. electric resistance
- D. electric pressure
- E. electric energy

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**17** What does a milliammeter measure?

- A. high electric force
- B. high electric current
- C. very low electric current
- D. very low electric force
- E. very low electric resistance

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**18** The unit for measuring electric current is

- A. millilitre
- B. litre
- C. watt
- D. volt
- E. ampere

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**19** How many milliamperes are there in one ampere?

- A. 10 milliamperes
- B. 100 milliamperes
- C. 1,000 milliamperes
- D. 10,000 milliamperes
- E. 100,000 milliamperes

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

## 20 Which statements are true?

- I. An electric current can only flow through a closed circuit made up of conductors
- II. An ammeter gives a more accurate reading than a milliammeter
- III. We must connect the positive (+) end of an ammeter to the positive (+) end of a battery
- IV. The three meters shown in the diagram below record different readings

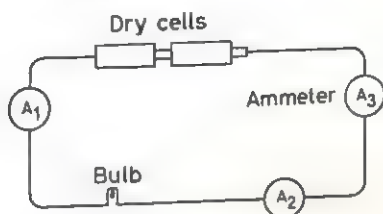


fig 62

- A. I, II and III
- B. I and III
- C. II and IV
- D. I and II
- E. III and IV

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

## 21 Study the diagrams carefully.

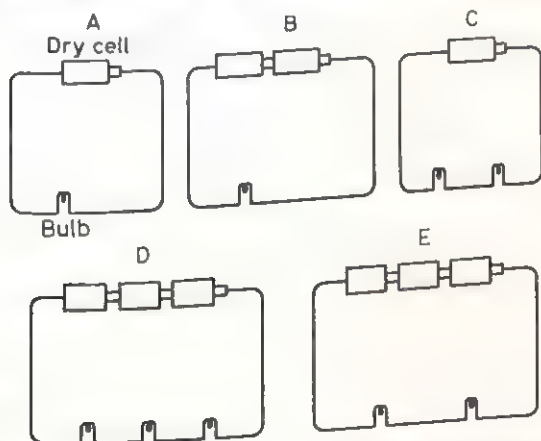


fig 63

- a. Which circuit has the brightest bulb or bulbs?
- b. Which circuit has the dimmest bulb or bulbs?

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**22** Study the circuit diagram; neglect the resistance in connecting wires.

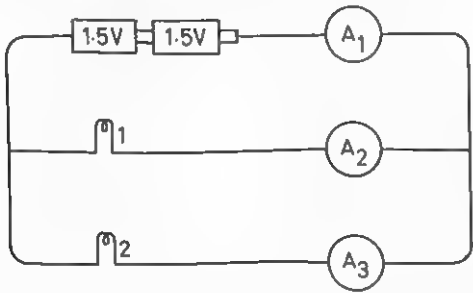


fig 64

Which statements about the circuit are true?

- I. Both bulbs light up equally brightly
- II. All the three ammeters record the same reading
- III. The first ammeter shows twice the amount of current shown by the second ammeter
- IV. Each bulb receives 1.5 volts

- A. I, II and III
- B. I and III
- C. II and IV
- D. I and II
- E. III and IV

☐ A ☐ B ☐ C ☐ D ☐ E

**23** Which of these statements about the circuit shown in question 22 are correct?

- I. The first bulb is brighter than the second bulb
- II. The third ammeter shows twice the current shown by the first ammeter
- III. The second and third ammeters show the same reading
- IV. Each bulb receives 3.0 volts

- A. I, II and III
- B. I and III
- C. II and IV
- D. I and II
- E. III and IV

☐ A ☐ B ☐ C ☐ D ☐ E

- 24 Study the circuit diagrams; neglect the resistance in the circuits.

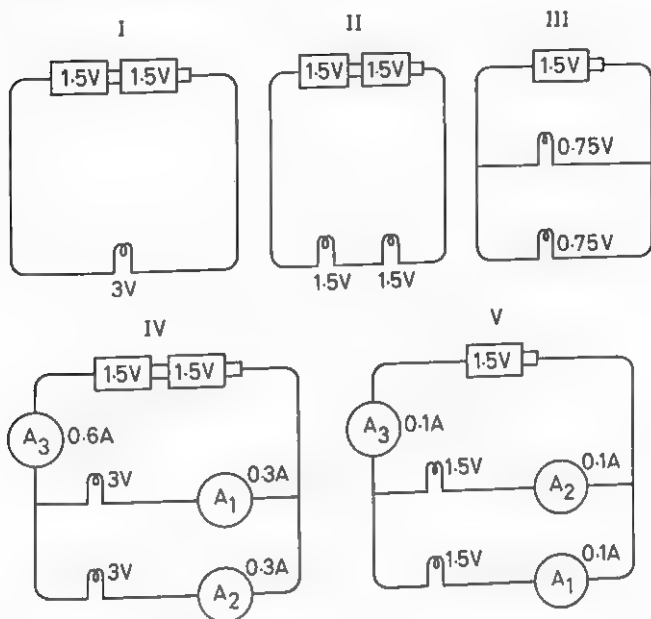


fig 65

Choose the diagrams which show a wrong reading.

- A. I and II
- B. II and III
- C. III and IV
- D. IV and V
- E. III and V

⋯A⋯ ⋯B⋯ ⋯C⋯ ⋯D⋯ ⋯E⋯

## Opposing the current

- 25 What happens to the current (as shown by the needle) in the ammeter as the clip X moves very slowly from P towards Q?

- A. The current increases slowly
- B. The current decreases slowly
- C. The current remains the same

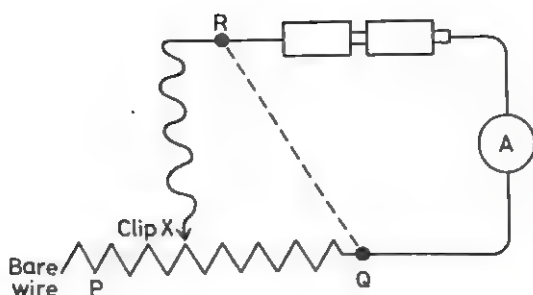


fig 66

- D. The current increases suddenly
- E. The current decreases suddenly

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**26** In question 25, the ammeter gives a reading of  $0.5\text{A}$  when the clip is at the position shown in the diagram.

What will be the reading if a wire is connected across RQ?

- A.  $0\text{A}$
- B.  $0.5\text{A}$
- C. less than  $0.5\text{A}$
- D. more than  $0.5\text{A}$
- E. the needle moves about; thus it does not give a reading

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

**27** Choose the statements which are true.

- I. A long wire resists a current more than a short wire
- II. A short wire resists a current more than a long wire
- III. A thin wire resists a current more than a thick wire
- IV. A thick wire resists a current more than a thin wire
- V. All wires have the same resistance to a current

- A. I and III
- B. I and IV
- C. II and III
- D. II and IV
- E. V only

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

28 A battery, a bulb and a variable resistance are connected in series. What is the effect, if any, on the light as the resistance increases?

- A. The light becomes dimmer
- B. The light becomes brighter
- C. The brightness remains the same
- D. The light goes off at once
- E. The bulb is fused

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

29 What is a rheostat used for in the laboratory?

- A. to control the resistance of a bulb
- B. to control the wattage of a bulb
- C. to control the voltage of a dry cell
- D. to control the voltage of a battery
- E. to control the current flowing through a circuit

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

30 Which of the following would be useful to dim the lights on a stage?

- A. batteries
- B. dry cells
- C. ammeters
- D. rheostats
- E. voltmeters

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

31 Given wires, all of the same thickness and length, but of different materials. Which one gives the least resistance to a current?

- A. copper
- B. iron
- C. tin
- D. nichrome
- E. tungsten

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

## Heating by current

**32** An electric current passes through a wire and makes it hot.  
What energy change takes place?

- A. chemical → electrical
- B. electrical → heat
- C. electrical → light
- D. chemical → heat
- E. electrical → chemical

☐A ☐B ☐C ☐D ☐E

**33** A strong current passes through two wires of the same length and of the same material, but of different thicknesses.

Which statement below, if any, is correct?

- A. The thin wire becomes hotter than the thick wire
- B. The thick wire becomes hotter than the thin wire
- C. The two wires become equally hot
- D. The wires do not get hot
- E. None of the above statements is correct

☐A ☐B ☐C ☐D ☐E

**34** When a current passes through a wire, the wire becomes hot more quickly if it is very thin. Why does a thin wire become hot faster than a thick wire?

- A. The molecules in a thin wire are closer together
- B. The molecules in a thin wire are more active
- C. A thin wire is a better conductor of electricity
- D. A thin wire gives more resistance to a current
- E. A thin wire gives less resistance to a current

☐A ☐B ☐C ☐D ☐E

**35** Which of the following statements are true?

- I. When a current is passed through a wire, heat is produced



- II. When a current is passed through the filament of a bulb, the filament becomes so hot that it gives out light
- III. An electric iron has a coil of wire for a current to pass through, to make it hot
- IV. An electric oven does not make use of the heating effect of a current

- A. I and II
- B. II and III
- C. III and IV
- D. IV only
- E. I, II and III

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- 36** The circuit shown below is set up, and the bulbs are lighted. The fuse wire is just strong enough to carry the current.

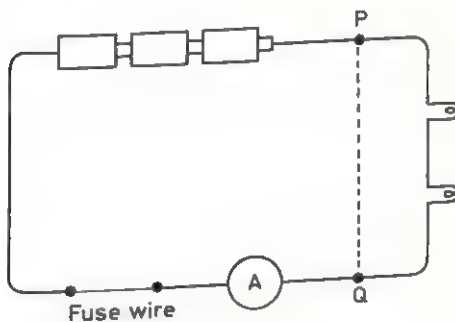


fig 67

- a. What happens if a wire is connected across PQ?

- A. The dry cells go flat
- B. The fuse wire melts
- C. The fuse wire catches fire
- D. Nothing will happen to the fuse wire
- E. The bulbs can still light up

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- b. The following statements are about the above experiment. Choose the statements which are true.

- I. When PQ is connected by wire, the bulbs fuse
- II. When PQ is connected by wire, the ammeter reading goes up
- III. When PQ is connected by wire, the ammeter reading goes down
- IV. When PQ is connected by wire, the ammeter reading remains the same

- A. I and II
- B. I and III
- C. I and IV
- D. II only
- E. III only

☐ A ☐ B ☐ C ☐ D ☐ E

**37** How does a fuse wire in a house circuit help?

- A. It lowers the resistance in the circuit
- B. It lessens the amount of electricity used
- C. It prevents extra current from passing through the circuit
- D. It makes the bulbs brighter
- E. It makes the bulbs last longer

☐ A ☐ B ☐ C ☐ D ☐ E

**38** Fuse wires are rated in

- A. volts
- B. watts
- C. ohms
- D. milliamperes
- E. amperes

☐ A ☐ B ☐ C ☐ D ☐ E

## Driving the current

**39** How many volts can one dry torch cell supply?

- A. 0.5 volt
- B. 1.0 volt
- C. 1.5 volts
- D. 2.0 volts
- E. 2.5 volts

☐ A ☐ B ☐ C ☐ D ☐ E

- 40 Study the circuit diagram; neglect any resistance in the circuit.

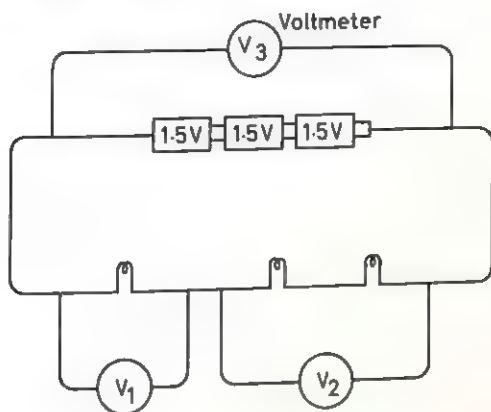


fig 68

- a. What reading will the first voltmeter show?

A. 0 volt  
B. 1.5 volts  
C. 3.0 volts  
D. 4.5 volts  
E. 6.0 volts

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- b. What reading will the second voltmeter show?

A. 0 volt  
B. 1.5 volts  
C. 3.0 volts  
D. 4.5 volts  
E. 6.0 volts

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- c. What reading will the third voltmeter show?

A. 0 volt  
B. 1.5 volts  
C. 3.0 volts  
D. 4.5 volts  
E. 6.0 volts

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- 41 What reading will the voltmeter show; neglecting resistance in the circuit?

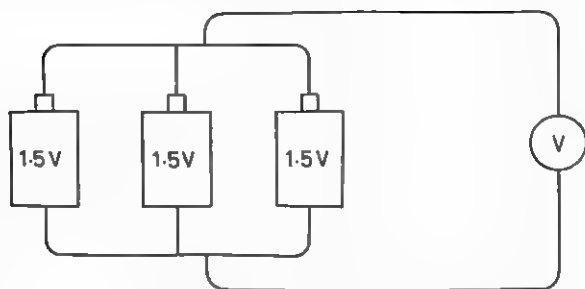


fig 69

- A. 0 volt
- B. 1.5 volts
- C. 3.0 volts
- D. 4.5 volts
- E. 6.0 volts

☐ A ☐ B ☐ C ☐ D ☐ E

- 42 What does a voltmeter measure?

- A. voltage across any two points in a circuit
- B. amount of current in a circuit
- C. number of watts in a bulb
- D. resistance in a wire
- E. brightness of a bulb

☐ A ☐ B ☐ C ☐ D ☐ E

- 43 Which statements are true?

- I. The greater the voltage of a battery, the greater is the current driven through the circuit
- II. An ammeter is always connected in parallel in a circuit
- III. A voltmeter is always connected across two points in a circuit
- IV. When two cells are connected in series, the total voltage is equal to that of one cell only, but the cells last longer

- A. I, II and III
- B. I and III

- C. II and IV
- D. I and II
- E. III and IV

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- 44** Two dry cells are connected to a bulb as shown in the diagram.

How many volts is the bulb likely to receive?

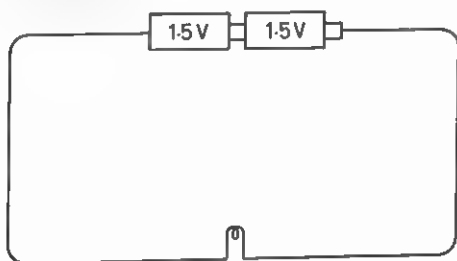


fig 70

- A. 1.0 volt
- B. 2.0 volts
- C. 3.0 volts
- D. 4.0 volts
- E. 5.0 volts

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- 45** Two dry cells are connected to a bulb as shown in the diagram.

How many volts is the bulb likely to receive?

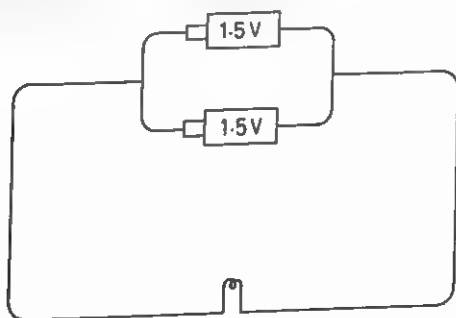


fig 71

- A. 1.0 volt
- B. 1.5 volts
- C. 2.0 volts
- D. 2.5 volts
- E. 3.0 volts

~~A~~ ~~B~~ ~~C~~ ~~D~~ ~~E~~

- 46 Study the circuit diagrams and answer the questions which follow.

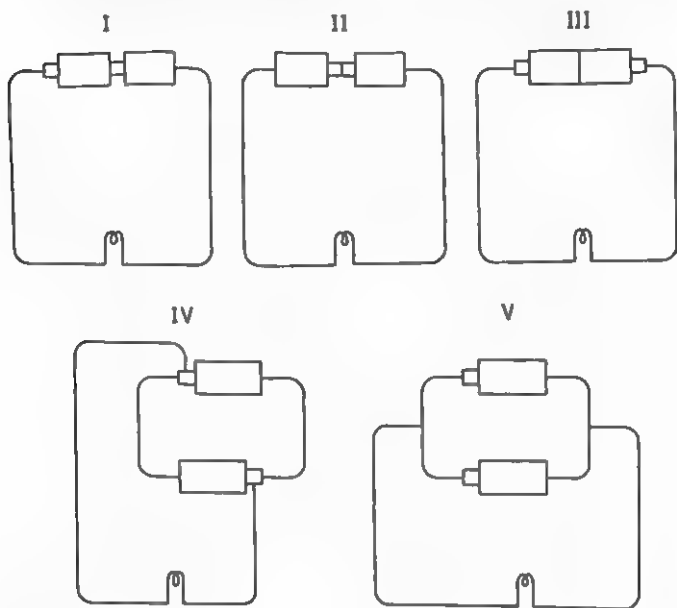


fig 72

- a. Which diagram shows two dry cells connected in series?

- A. I  
B. II  
C. III  
D. IV  
E. V

☐ A ☐ B ☐ C ☐ D ☐ E

- b. Which diagram shows two dry cells connected in parallel?

- A. I  
B. II  
C. III  
D. IV  
E. V

☐ A ☐ B ☐ C ☐ D ☐ E

c. Which bulb receives the most number of volts?

- A. I
- B. II
- C. III
- D. IV
- E. V

☐ A ☐ B ☐ C ☐ D ☐ E

d. If one dry cell supplies 1.5 volts, which bulb is likely to get 1.5 volts?

- A. I
- B. II
- C. III
- D. IV
- E. V

☐ A ☐ B ☐ C ☐ D ☐ E

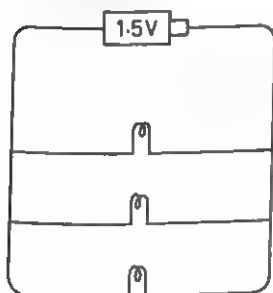
e. Which bulbs will not light up at all?

- A. I and II
- B. II and III
- C. III and V
- D. I, II and III
- E. II, III and IV

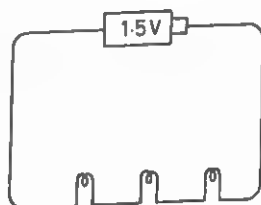
☐ A ☐ B ☐ C ☐ D ☐ E

## Electricity at home

47 Choose the statements which are true about the circuits below. Neglect the resistance in the circuits.



Circuit 1



Circuit 2

- I. Each bulb in circuit 1 receives 0.5 volt
- II. Each bulb in circuit 2 receives 1.5 volts
- III. The current through each bulb in circuit 1 is the same
- IV. The current through any part of circuit 2 is the same

- A. I, II and III
- B. I and III
- C. II and IV
- D. III and IV
- E. none of these combinations

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**48** Which of the following statements are true?

- I. When bulbs are connected in parallel, the rest can still light up if one bulb fuses
- II. When bulbs are connected in series, the rest cannot light up if one bulb fuses
- III. Street lamps are connected in series
- IV. It is dangerous to play about with the mains voltages

- A. I, II and III
- B. I and III
- C. II and IV
- D. I and II
- E. I, II and IV

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

**49** Which of these things usually has a fuse wire placed in it?

- A. an electric iron
- B. an electric stove
- C. an ammeter
- D. a three-pin power plug
- E. a bulb

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~



50 Of the following statements, one is false.  
Choose the false statement.

- A. The bulbs in a house are connected in series
- B. A three-pin power plug usually has a 13A fuse
- C. A three-pin power plug has an earth wire
- D. The voltage supply in a house is about 240 volts
- E. An electric current flows in a circuit because there are more negative charges at one point than at another

~~A~~   ~~B~~   ~~C~~   ~~D~~   ~~E~~

# Answers

## 1 Introducing science

1B	2C	3B	4C	5B
6C	7C	8C	9D	10A
11D	12A	13C	14D	15D
16C	17C	18A	19E	20E
21A	22C	23B	24A	25D
26D	27D	28C	29B	30D
31E	32E	33A	34C	35B
36E	37B	38B	39A	40C

## 2 Looking at living things

1C	2B	3A	4D	5D
6D	7B	8B	9B	10A
11A	12D	13E	14B	15A
16D	17D	18A	19E	20C
21C	22A	23B	24B	25A
26B	27E	28A	29C	30B
31D	32E	33A	34C	35E
36E	37A	38B	39C	40A
41A	42D	43C	44E	45A
46C	47D	48D	49A	50B
51C	52E	53B	54A	55B
56C	57E	58D	59A	60C
61B	62D	63A	64C	65E
66C	67B	68A	69D	70E
71B	72A	73E	74E	75D
76C	77E	78C	79A	80D
81B	82B	83A	84C	

## 3 Energy

1A	2B	3D	4B	5A
6D	7E	8B	9B	10C
11A	12B	13B	14C	15A
16E	17A	18C	19E	20E
21A	22B	23B	24B	25C
26D	27D	28D	29A	30A
31C	32A	33E	34C	35D

36C	37E	38C	39A	40B
41D	42C	43B	44E	45C
46D	47A	48A	49C	50D
51B	52E	53D	54A	55C
56C	57E	58A	59E	60B
61D	62C	63A	64C	65E
66B	67D	68A	69E	70C
71B	72E	73D	74A	75C
76E	77A	78D		

#### 4 Matter as particles

1A	2C	3A	4E	5D
6A	7B	8D	9C	10B
11E	12C	13B	14D	15E
16D	17A	18C	19E	20D
21B	22E	23B	24A	25C
26A	27C	28E	29B	30D
31C	32A	33E	34C	35E
36D	37B	38C	39A	40A
41B	42C	43A	44E	45E
46D	47B	48D	49B	50B
51E	52A	53D	54A	55D
56C	57C	58C	59C	60E
61B	62D	63A	64E	65C
66E	67A	68B	69D	70A
71B	72C	73C	74D	75A
76E	77B	78D	79A	80C
81E	82E	83D	84E	85B
86E	87C	88B	89A	90D
91A	92C	93D	94B	95C
96D	97A	98B	99C	100E
101D	102E	103A	104B	105A
106E	107E	108C	109D	110D
111E	112A	113B	114C	115B
116A	117C	118E		

#### 5 Cells and reproduction

1 A	2(a)E	2(b)D	3(a)E	3(b)C
3(c)B	4 B	5 C	6 C	7 E
8 D	9 A	10 B	11 A	12 C

13 D	14 E	15(a) B	15(b) D	15(c) D
15(d) E	15(e) D	16(a) A	16(b) C	16(c) C
16(d) A	16(e) C	16(f) B	17 B	18 E
19 B	20 A	21(a) B	21(b) D	21(c) A
21(d) B	21(e) B	22 E	23 C	24 A
25 E	26 D	27 E	28 A	29 D
30 A	31 C	32 B	33 A	34 E
35 D	36 C	37(a) B	37(b) A	37(c) E
37(d) C	37(e) D	38(a) C	38(b) C	39 A
40 B	41 D	42 B	43 E	44(a) A
44(b) A	44(c) D	44(d) C	45 E	46(a) B
46(b) D	46(c) E	46(d) D	47 E	48 B
49 A	50 D	51 B	52 C	53 A
54 A	55 B	56 A	57 A	58 D
59 E	60(a) C	60(b) A	60(c) C	60(d) D
60(e) E	60(f) B	61 D	62 A	63 E
64(a) A	64(b) B	64(c) B	64(d) B	64(e) D
64(f) C	64(g) A	65(a) E	65(b) C	65(c) D
65(d) E	66 A	67 B	68 C	69 D
70(a) C	70(b) A	70(c) C	70(d) E	71 E
72 A	73 C	74 D	75 E	76 B
77 A	78 E	79 E	80 D	81 D
82 B	83 C	84 E	85 C	86 B
87 B	88 D	89 A		

## 6 Electricity

1(a) A	1(b) C	1(c) B	2 D	3 E
4 A	5 A	6 E	7 C	8 D
9 B	10 D	11 B	12 C	13 D
14 C	15 E	16 A	17 C	18 E
19 C	20 B	21(a) B	21(b) C	22 B
23 E	24 E	25 A	26 D	27 A
28 A	29 E	30 D	31 A	32 B
33 A	34 D	35 E	36(a) B	36(b) D
37 C	38 E	39 C	40(a) B	40(b) C
40(c) D	41 B	42 A	43 B	44 C
45 B	46(a) A	46(b) E	46(c) A	46(d) E
46(e) E	47 D	48 E	49 D	50 A